CIO

THE MAGAZINE FOR INFORMATION EXEC

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COVER STORY

Mapping Global IT Strategy

NEW COLUMN:

Gartner View

How To Gain Control Of IT Assets

Citicorp's Mary Cirillo

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EMPLOYEE ID

CHISHOLM, KIRK
NAME

Kirk Chisholm
SIGNATURE

1200346
NUMBER

06/93
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EMPLOYEE ID

PAYNTER, MARY
NAME

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SIGNATURE

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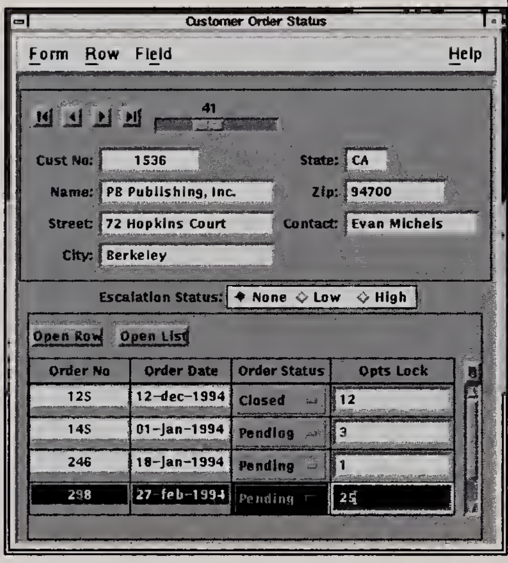

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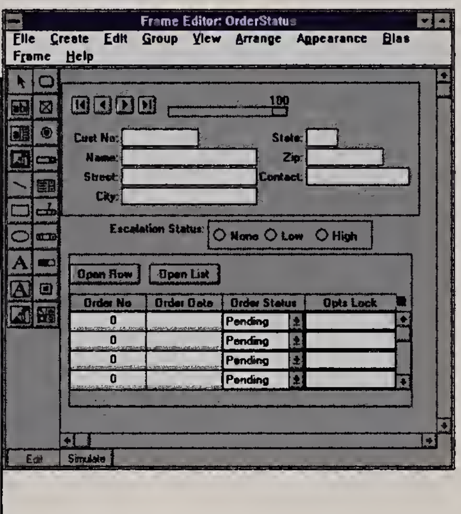

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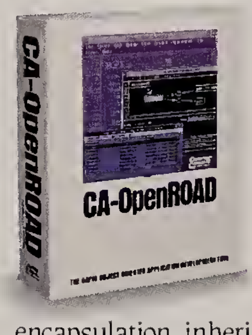

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COVER STORY

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The Cares Up There

Not everyone is cut out for the heady stuff of global technology strategy. It requires vision, the planning abilities of a general and nerves of steel.

By E.B. Baatz

Thinking big
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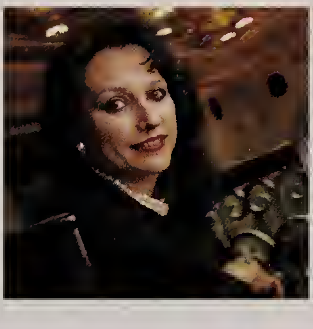
SECOND OPINIONS: DISTRIBUTED DATA **42**

Distributing the Data Wealth

Distributed data puts more power in the hands of decision makers. It also makes life more complicated for those in charge of making information accessible—and making sure it's accurate and secure. A panel of experts offers advice on how to manage distributed data effectively.

By Megan Santosus



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Widget Racers

With basic research on the back burner and budgets nearly at a standstill, the hot R&D objective these days is to turn ideas into products at a breakneck pace. How are the scientists—and their business colleagues—coping?

By Carol Hildebrand

Finding it first **68**

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Ready for Takeoff

After years of razor-thin profit margins, Delta Air Lines teamed up with AT&T to improve its IT operations and cut costs. The partnership is not a traditional outsourcing arrangement, and observers wonder, "Will it fly?"

By Daniel Gross

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COLUMNS

I.S. VALUE ADDED 30

INSIGHTS: A MATTER OF MARKETING

If IS departments are to survive, they must not only add value for their customers but also make sure those customers recognize the added value. Most systems groups focus on the first requirement, but the second is even more important.

By Daniel E. Klingler

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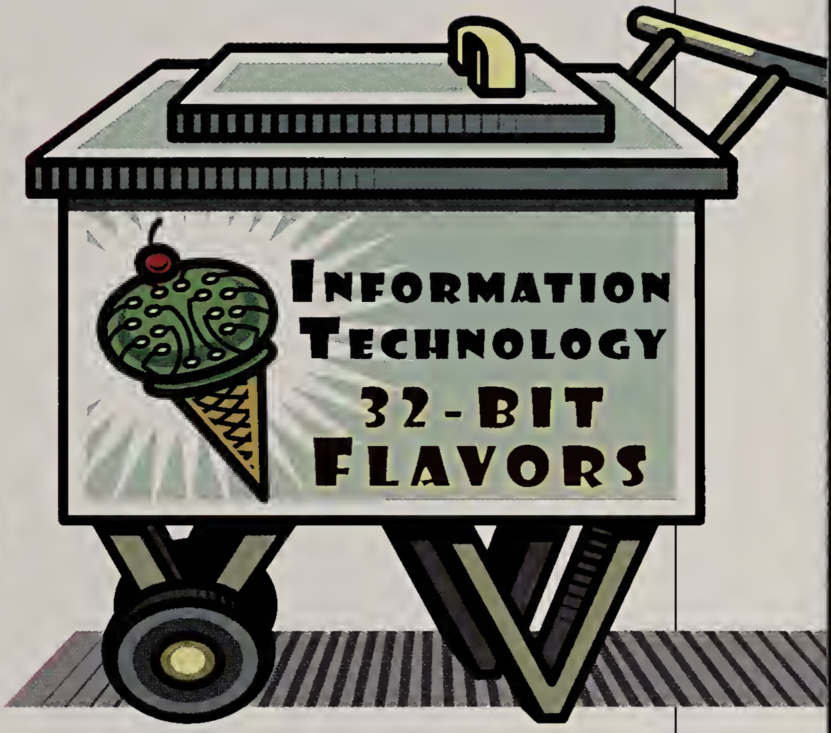
GARTNER VIEW: ASSET APPRECIATION

New tools and structured approaches can simplify IT asset management—even for mercurial PC resources—and generate significant savings to boot.

By Mike Vargo



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Surround strategies can help meet the demands of modern-day code without tossing out legacy systems.

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CIO CONFIDENTIAL: YOUR BLOODY ROIT

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LETTER FROM THE EDITOR

Job One for most IS executives today is to match the IS strategy with their company's business strategy for competitive advantage. For many organizations, the challenge begins with the decision to disperse information systems resources throughout a company's individual business units.

But IS executives are by nature a risk-averse lot. I'm convinced that many still prefer the old but proven centralized computing model to the fashionable but risky distributed-computing environment. One danger, then, in developing a distributed-technology implementation plan is that IS will simply impose strategic IS mentalities on tactical business units. Such replication is a prescription for disaster.

IS executives may also be tempted to recentralize selected functions to handle the complexities of supporting open systems. Confusion and uncertainty can prevail in a distributed environment. Tools to manage client/server systems are not as robust as those for mainframes. Data replication, capacity planning, backup and archiving, end-user support and security workloads increase in an open environment. Suddenly recentralization—with its benefits of control, cost and efficiency—is starting to look good. Some companies, in fact, are doing it.

But not the three international companies described in Senior Writer E.B. Baatz's feature story, "The Cares Up There," which begins on Page 56. Baatz describes how IS executives at Coopers & Lybrand, Citicorp and Xerox are developing and implementing global IT strategies. Each company seeks to marry a common technical infrastructure with a common global business strategy but with the right mix of central control and local autonomy to meet local needs.

You'll notice that "seamlessness," "coordinated business structure" and "unified entity" are the terms these CIOs use to describe their mission. "Recentralization," while it may have crossed their minds, is not in their vocabulary.

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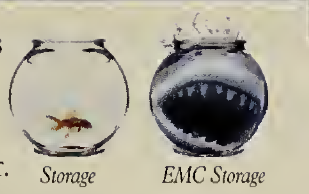

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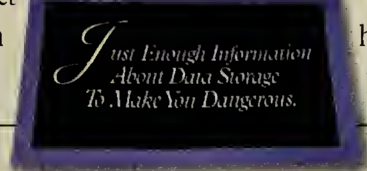

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LETTER FROM THE PUBLISHER

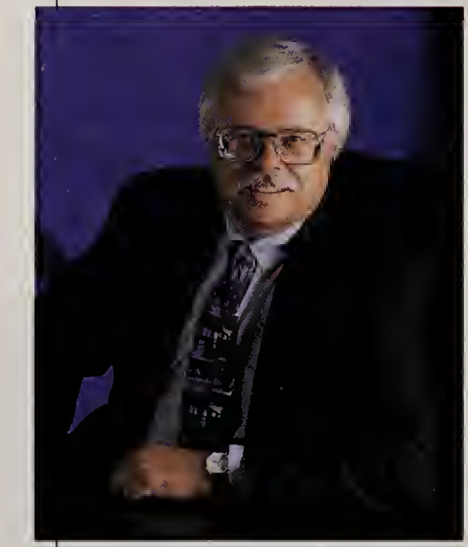

PHOTO BY WEBB CHAPPELL

"Going global."

Everybody seems to be doing it. But what exactly does it mean?

It depends on whom you ask. As we noted in the August CIO-100 issue, some organizations, such as American International Group Inc., adapt products, services or marketing to each region or location. Others, such as Ford Motor Co. and Whirlpool Corp., define a global approach by plugging new markets into a cohesive worldwide operation.

We can't say which global business strategy is better; that depends on the needs and goals of a particular organization. We can say, however, that a global *technology* strategy—a single, comprehensive, worldwide IT plan—can bring about dramatic results when aligned with general business strategy.

A workable, worldwide IT strategy is often the only difference between a multinational and a truly global company. The difference is like comparing a membership in the National Honor Society with a membership in Mensa; both are prestigious, but only a select few can meet the standards of the latter.

Can your organization make the grade with global technology strategy? Will you be able to manage a comprehensive system without losing the pliability necessary for local needs? The profiles featured in "The Cares Up There," Page 56, will tell you a lot about what makes for a successful global CIO and what to expect in implementing IT seamlessness. Check it out.

P.S. We are now taking reservations for the next Perspectives conference, "The Psychology of IT: The CIO's New Mind Set," to be held Oct. 15-18, 1995, at the Hyatt Grand Cypress Resort in Orlando, Fla. To reserve your space, or for more information, please call 800 366-0246 or refer to our Web site—*http://www.cio.com/conferences/perspectiv.html.*

Coming In CIO

Is ATM in Your Future?

Implementation of asynchronous transfer mode (ATM)—the powerful, high-speed packet-switching transmission that experts say will be the basis for most network communications by the year 1997—appears to be going slower than experts predicted. *CIO* will look at three advanced organizations that are now using ATM technology—not just thinking about it.

Psychology of IT

The covenant between IS folks and the user community is becoming more dynamic, with a special emphasis on communication and team building. *CIO* looks at how the Myers-Briggs Type Indicator reveals various personality types and some of the forces behind their hot buttons.

Competitive Strategies

Companies focusing on operational excellence may be missing the mark and sacrificing their competitive advantage. So says Harvard Business School Professor Michael Porter in an interview with Senior Editor Richard Pastore. Find out how IS can help to support the effort to retain that competitive edge.

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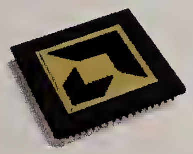

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TRENDLINES

AGENTLESS TRAVEL

JET LAG WITHOUT PHONE TAG

It's no longer enough to save corporate travelers money during the reservations process. Now that businesses have downsized and fewer people are traveling more often, time savings have become equally important, according to Hal F. Rosenbluth, the *Wunderkind* of corporate travel and president and CEO of Rosenbluth International of Philadelphia. The do-it-yourself, PC-based, full-service system announced by Rosenbluth and partner AT&T Corp. in July guarantees users a confirmation of their travel requests—or a list of travel options—in under five minutes, without human intervention. When the system goes completely interactive in real-time later this year, the turnaround time will shrink to a fraction of a second. (Tickets, when needed, are printed at a specified customer location, or are mailed.)

Rosenbluth has already made waves in his industry through use of technology and patented systems that guarantee to find the lowest fare (see "The Mad Doctor of Corporate Travel," *CIO,* May 1, 1992). He sees interactive, agentless systems as a trend for the industry. "There's a dramatic movement that will take place toward this because it's becoming more difficult for travel agencies to afford and attract the kind of people that can handle corporate travel reservations professionally," Rosenbluth says. Corporations want faster service and travelers want to avoid frustrating reservations encounters with agents or airlines.

The system also makes sense for Rosenbluth's agency because it greatly reduces the costs per ticket issued—a point made more cogent by the recent reductions in commissions that airlines pay to travel agencies. Placing dedicated software in customer sites also helps lock in their loyalty, since the inconvenience and cost of switching agents becomes that much greater.

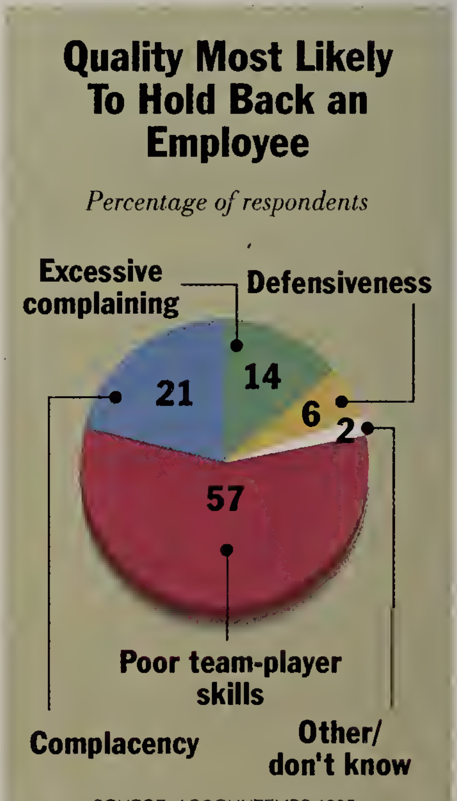
Rosenbluth is confident that the system will not compromise the excellent customer service reputation his agency has built. "It doesn't matter if the interaction is with us or through a data exchange," he says. "It has to be elegant, right and quick, and it has got to have value-added services that people can't get elsewhere." As for services, the system will include the lowest-fare searching mechanism as well as expense tracking and reporting capabilities. In addition, it can be customized to particular corporations' travel policies and travelers' preferences.

AT&T will handle integration with customers' existing architecture, as well as network services, security issues and technical support. Pricing will be determined customer by customer, based on technical structures and the bundled services requested. Pricing will be more consistent for individual consumers, small businesses and travel agents when the rollout reaches them at a later date.

–Richard Pastore

THE WOES OF GOING SOLO

Loners, not whiners, are most likely to have trouble climbing the corporate ladder. In a survey of 150 executives sponsored by Accountemps, a temporary staffing service for accounting and finance, 57 percent said "poor team-player skills" most hurt an adequately performing worker's chances for career advancement. "The office of the '90s has become less hierarchical. Increasingly, managers are relying more on collaborative efforts than on chains of command," says Max Messmer, Accountemps chairman. "Consequently, greater emphasis is being placed on teamwork and a sense of community at work." 🟥



SOURCE: ACCOUNTEMPS, 1995

CHART BY MICHAEL SIGGINS; ILLUSTRATION BY PHILIP ANDERSON

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INSIDE

Conference Overview
Joseph L. Levy & Lynda Rosenthal

Staying Ahead of the Class
IT must drive enterprises to openly communicate and become learning organizations.

Agenda
Detailed information about each general, concurrent and professional session and scheduled activities throughout the conference.

Companion Program
Join conference participants for receptions and meals, and enjoy a special companion breakfast, a tone and stretch class on the upper pool deck and an optional excursion.

Hyatt Grand Cypress
Stay at Orlando's loveliest hotel, at the edge of one of America's most challenging Nicklaus-designed golf courses.

Corporate Hosts
During the conference, our Corporate Hosts, a select group of innovative, top-quality companies, will display a wide range of solutions to address IT management issues.

Enrollment Form
Complete and return the enrollment form by **fax** to 508-879-7720; **mail** to 492 Old Connecticut Path, Framingham, MA 01701; or **call** 800-366-0246 to enroll by phone.

Conference Overview

Investigate the psychology of technology and examine personality profiles and how they affect communications.

As the nature of IT has changed so radically over the past five years, so have the requirements for being a successful CIO. Change and growth, both personal and professional, are everywhere and constant and, as we know, resistance to change is continuous.

Each day, CIOs face changes in the competitive and economic landscape in which their businesses operate. With centralized data centers yielding to decentralized client/server shops, CIOs are being forced to become less technical and yet more business savvy.

Just as information systems are needed to share data, so are learning processes required for knowledge sharing to be possible in this radically changing marketplace. This is why "rarely does sharing information change mental models and lead to fundamental improvement in business operations," says Peter Senge, author of *The Fifth Discipline* and co-author of the recently released *The Fifth Discipline Fieldbook*. CIOs need to learn how to share actionable information that can lead to increased success in business.

The Psychology of IT will bring together visionaries, leading IT practitioners and analysts, CEOs, our Corporate Hosts and the staff of *CIO* Magazine. For three and a half days, we'll explore why an ongoing learning cycle is critical to creating long-lasting change and what it takes to create an environment where true learning can occur and where new information has the chance of leading to increased knowledge and wisdom. We'll also investigate the psychology of technology and examine personality profiles and how they affect communications.

So, mark your calendar and join us October 15–18 in Orlando. Be sure to make your hotel and flight reservations as soon as possible; the hotel will sell out. Bring a colleague! Call your enrollment in to 800-366-0246, or fax it to 508-879-7720.

Regards,

Joseph L. Levy
Joseph L. Levy
President & Publisher
CIO Communications, Inc.

Lynda Rosenthal
Lynda Rosenthal
Senior Vice President & General Manager
Executive Programs

Staying Ahead of the Class

BY CAROL HILDEBRAND

From reengineering business processes to competing in a global economy, companies are realizing that not only is business as usual not good enough, it's downright dangerous. Companies can no longer get by with employees who simply learn their jobs and perform them. Now a smart company stays smart by creating a "learning organization," a company full of inquisitive, lifelong learners who are comfortable with fluidity.

However, such a mandate means more than collaborative research material residing on a network. "Sharing information is not enough," says Peter Senge, director of the Center for Organizational Learning at Massachusetts Institute of Technology's Sloan School of Management, author of *The Fifth Discipline,* and co-author of *The Fifth Discipline Fieldbook*. "You need to develop a learning process, and that's fundamentally different from just sharing information." Listening to somebody tell you how to ride a bicycle, for example, is sharing information, but you still won't be able to pedal off into the sunset. To do that, you need to learn and experience the process for yourself.

Companies need to build these learning processes into their cultures, Senge says. To do so, they must examine and change mental models — internal images of how the world works and images that limit us to familiar thoughts and acts — toward learning.

For IT executives, this presents a special set of challenges. Their mind sets are geared toward building and maintaining information systems, but, Senge says, "IS should disabuse itself of the silly notion that IT will produce learning." In *The Fifth Discipline*, Senge writes that learning is "act[ing], learn[ing] the consequences of our actions and then adjust[ing]." To the extent that some systems can be built to help us gain experience through training, "systems can help to a limited degree," he says. Most work done with learning, however, involves the far more difficult prospect of examining how personal attitudes can interact with different relationships to affect corporate learning and team building.

Any team will bring together a disparate set of these attitudes; experts agree that as companies rely more on collaborative efforts by cross-functional teams, employees will have to develop more "emotional literacy" to understand group dynamics. It's no surprise that many companies are using such tools as the Myers-Briggs Type Indicator to help workers identify the different values and motivations that lie behind colleagues' actions. There are 16 Myers-Briggs personality types, which are derived from eight personality preferences, such as thinking vs. feeling. None is better than another, but there are big differences. For example, IT types are historically skewed toward "thinking" rather than "feeling," which directly opposes the personality types of much of the user community. It's no wonder that IS/user relationships often suffer an unfortunate disconnect ➢

in communication. Tools like Myers-Briggs can help information technology executives understand users' motivations and build strong relationships with the user community.

IS staffers can also use some help with the softer skills when it comes to determining user requirements of new systems. "IT usually asks managers, 'What do you need?' " says James C. Wetherbe, director of the MIS Research Center at the University of Minnesota. "This would be as useful as a psychotherapist asking a patient what type of psychotherapy he or she needs. In neither case can the client accurately respond." Wetherbe says that successful application developers do less asking and more listening and observing.

When it comes to successful communication, group dynamics are not the only issue. The very technological tools used to communicate also have a psychological impact, according to Will Pape, CIO of VeriFone Inc., nominally based in Redwood City, Calif. VeriFone, which makes hardware for and manages networks and software for credit-card authorization, is one of the pioneers of "virtual work." With employees constantly dispersed, using the right method of communication is important when it comes to articulating and executing business imperatives, Pape says.

He has identified what he calls the "psychological impact" of more than 30 tools. For example, snail mail sits at the low end of his scale; it's "psychologically remote," he says. "However, people don't benefit from non-verbal cues, such as body language, that typify the high end of the scale — the high end being face-to-face communication."

Everyone needs to experience the learning process first-hand.

VeriFone workers can use the ratings to choose a more effective method of communication in a touchy situation or when they do not know a co-worker well enough to rely on a past history of shared experiences as a guide to current events. Most companies rely too much on such relatively low-level tools as the telephone and e-mail. Installing such tools as videoconferencing or adding an audioconferencing option to a geographically scattered work team can provide a much richer level of information, Pape says.

Enhancing communication between internal groups in a company is difficult enough. Establishing a customer/vendor dialogue is even tougher, but many companies focusing on raising their levels of customer satisfaction say it is nearly as important.

Changes in market segments and distribution channels "force CIOs to rethink what kinds of information and support are required" for line managers to succeed at that old adage, "Put the customer first," says Barton Goldenberg, president of ISM Inc., a Washington, D.C.-based consultancy. As organizations strive to look outward, to the customer, Goldenberg says that CIOs need to focus on the outside world as well, particularly the shifting business conditions affecting their companies and the emerging tools that take advantage of fluid conditions.

Whether it is perfecting internal relationships or choosing the right tools to help win customer loyalty, today's CIOs face the challenge of changing their business mind sets. It used to be that the only sure things in this world were death and taxes. But today's corporate executives should add one more thing to the list: Constant change is here to stay — in business processes, in IT and, most of all, in business relationships.■

Disciplinary Actions

Peter Senge's The Fifth Discipline *espouses what he calls "five new component technologies [that] are gradually converging to innovate learning organizations. Though developed separately, each will, I believe, prove critical to the others' success."*

SYSTEMS THINKING

Businesses are systems-bound by invisible factors of interrelated actions. As humans, we are part of the whole web, which makes it difficult to see the forest for the trees. Systems thinking helps us see the full picture more clearly.

PERSONAL MASTERY

This is the discipline of continual commitment to focusing our energies on deepening our personal vision — a personal commitment to lifelong learning, Senge says.

MENTAL MODELS

These are deeply ingrained personal assumptions about one's world based on past history and internal lessons learned that influence our view of the world and how we act on it.

BUILDING SHARED VISION

Any organization with any pretensions to greatness is able to inspire its workforce into creativity through a shared picture of what the future should look like.

TEAM LEARNING

When a team is truly learning together, the collective insights are stronger than anything put forth by its individual members. Teams need to examine patterns of defensiveness that can cloud clear-flowing interaction among members.

Orlando's Hyatt Grand Cypress

The spectacular beauty of the Hyatt Grand Cypress features lush tropical gardens, exotic birds and tropical plants combined with the 45-hole Jack Nicklaus signature golf course, a large white sand beach on a 21-acre lake, professional tennis facilities and a complete health club. The Hyatt is adjacent to Walt Disney World, 20 minutes from downtown Orlando and Orlando International Airport, and is convenient to The Magic Kingdom and EPCOT Center at Walt Disney World, Disney–MGM Studios Theme Park, Cypress Gardens, Kennedy Space Center, Busch Gardens and Splendid China.

TO ENROLL CALL 800-366-0246

CIO
PERSPECTIVES

Sunday, October 15

3:00pm–6:00pm
Conference Registration

7:00pm–9:30pm
Welcome Reception

9:30pm–12:00am
Hospitality/Networking

Monday, October 16

7:30am–8:15am
Breakfast

8:15am–8:20am
Welcome & Opening Remarks

Joseph L. Levy
President & Publisher
CIO Communications, Inc.

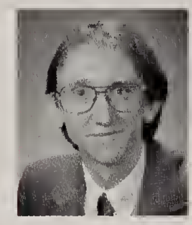
8:20am–9:30am
A Psychotherapeutic Approach to Getting Information Requirements Right

Conference Moderator
Dr. Jim Wetherbe
Director
MIS Research Center
University of Minnesota

Federal Express Professor of Excellence & Director
Center for Cycle Time Research
University of Memphis

Most systems designers determine information requirements by asking managers, "What do you need?" This is as useful as a psychotherapist asking a patient what type of psychotherapy he or she needs. In neither case can the client accurately respond. Failure to get information requirements correct results in a major loss of productivity in systems development. In this presentation, the four most common mistakes that can occur when determining information requirements will be discussed, along with their solutions.

9:30am–10:15am
Understanding Personality Differences Among Executives: Using Myers-Briggs to Build Relationships



Gerald P. Macdaid
CEO
Center for Applications of Psychological Type

Constructive use of personality differences can be a potent tool for improving human relationships in technical environments. The Myers-Briggs Type Indicator is a popular tool for assessing such differences and is useful for team building, quality management and effective problem solving. Macdaid will include an overview of type concepts; discuss data on personality differences between the IT function, other functional areas in the company and relevant customer groups; and discuss how these differences affect IT professionals and their constituents.

10:15am–10:45am
Coffee Break

10:45am–11:30am
The Psychological Impact of Communication Tools for the Virtual Corporation

William R. Pape
CIO
VeriFone, Inc.

As companies work to globally decentralize, they must pay special attention to the internal communication tools that make an organization seem as if everyone is working from one location. Many people think that the only communication tool needed in a global virtual corporation is electronic mail, but this is not true. VeriFone has been operating as a virtual corporation since the early 1980s and has developed a list of 32 specific communication tools appropriate to the virtual corporation. This session will present the tool kit and discuss the strengths and weaknesses of each tool.

11:30am–12:15pm
Rethinking the Business at Allstate: An Evolutionary Process

Frank Pollard
Senior Vice President & CIO
Information Technology
Allstate Insurance Company

The insights, attitudes and objectives leading to the decision to restructure one of the world's largest insurance companies revolve around intra-company and client relationships, improving the overall value and efficiency of IS as a business enabler, and the IS organization itself. The strategies, processes and solutions used to transform the company will be discussed, highlighting the elimination of redundant and legacy systems, building a data warehouse and the value of selectively outsourcing and partnering.

12:15pm–1:30pm
Luncheon

1:30pm–6:30pm
Professional Sessions, Networking & Recreation

1:30pm
Golf Tournament
The New Course

1:30pm
Tennis Tournament

PROFESSIONAL SESSIONS

1:30pm–3:00pm
Service Up, Costs Down? A Practical Approach

Jan Stambaugh
Manager
Computing & Technology Services
Hewlett-Packard Company

Like most other corporations, Hewlett-Packard has been pressed to reduce the cost structure of its IT organization. Yet end users are demanding higher service levels than ever before. In this session, you will hear how HP tackled both objectives at once.

1:45pm–3:45pm
Surviving the Earthquakes in IT Leadership

Charlotte Roberts
Co-Author
The Fifth Discipline Fieldbook
Partner
The Learning Circle
Courtesy of EDS

The new name for "IT" is Organizational Change Technology (OCT), with the goal of developing organizational perceptiveness, collective intelligence and delivery agility. In this session, two OCT imperatives for building competitive advantage will be explored: the continuous refinement of mental models and the development of scenario thinking.

6:30pm–7:30pm
Reception

7:30pm–9:00pm
Dinner

9:00pm–12:00am
Hospitality/Networking

Tuesday, October 17

7:15am–8:00am
Breakfast

8:00am–8:45am
New Business and Technology Assumptions for the Digital Economy

Don Tapscott
Chairman
Alliance for Converging Technologies

A new medium is impacting our economic and social lives with new dynamics, rules and drivers for success. The internetworked business is emerging — as different from the old corporation as it is from the feudal craft shop. What's so new about the new economy? How can the new infrastructure enable wealth creation and societal development? How can companies manage a transition to the new technology and the digital creation, marketing and distribution of goods and services?

8:45am–9:30am
The Last Frontier for Competitive Advantage: Optimizing the Involvement of People in the Business

R. Timothy Epps
Vice President of People Systems
Saturn Corporation

The last frontier for competitive advantage is optimizing the involvement of people in the business. Rethinking traditional organizational and compensation systems has yielded nontraditional management practices, including teamwork, empowerment and worker participation in business decisions. This has been accompanied by a shift toward pay systems that include significant business-performance alignments for employees at all levels. Learn how Saturn is providing the structures and systems that support people in the new competitive environment.

9:30am–10:15am
Think Global, Implement Local: An IT Challenge

Patrick J. Zilvitis
Vice President
Corporate Information Technology
The Gillette Company

Gillette, a growth-driven consumer-products company, is currently changing its thought processes by reengineering the supply chain and other critical business processes, consolidating activities, aligning business and IT goals, and forming cross-functional teams driven by the business. Gillette is also moving rapidly from a proprietary data-center environment to an open, distributed client/server approach to deliver information to the desktop client. This session will paint a business-driven vision for IT in the year 2000 at The Gillette Co.

10:15am–10:45am
Coffee Break

10:45am–11:30am
Concurrent Sessions

11:45am–12:30pm
Concurrent Sessions: Repeated

12:30pm–1:30pm
Luncheon

1:30pm–2:15pm
Concurrent Sessions

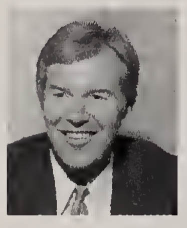
2:30pm–3:15pm
Concurrent Sessions: Repeated

3:15pm–3:30pm
Coffee Break

When this symbol appears, each attendee will receive a copy of the presenters' newest book.

3:30pm–5:30pm

From Information Systems to Learning Processes: The Challenge for Fundamental Change



Peter Senge
Director, Center for Organizational Learning
Sloan School of Management
Massachusetts Institute of Technology

Just as information systems are needed to share data, so are learning processes required for knowledge sharing. Drawing on his work with member organizations of MIT's Organizational Learning Center, Senge will describe how new infrastructures that support an ongoing learning cycle are critical to creating long-lasting change. Senge will talk about creating an environment where true learning can occur, where people are able to challenge their traditional ways of seeing and acting in the world, and where new information has the chance of leading to increased knowledge and wisdom.

5:30pm–6:30pm

Reception with Peter Senge

6:30pm–12:00am

Hospitality/Networking

Wednesday, October 18

7:15am–8:00am

Breakfast

8:00am–8:45am

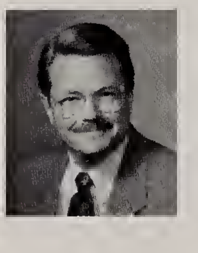
When New Business Strategies Equal New IT Opportunities

Barton Goldenberg
President
ISM, Inc.

Key emerging business, marketing and sales strategies, such as market segmentation, distribution-channel strategies and the growing use of product-development teams, can make the CIO a true business partner. New information technologies — mobile computing, micro-marketing techniques and the information superhighway — are affecting the successful formulation and implementation of these new strategies. Only the CIO can deliver the technology to support these new avenues.

8:45am–9:30am

Transforming IT in a Global Company

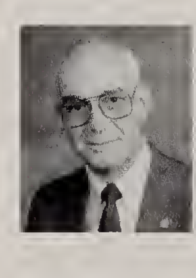


Michael D. Radcliff
Vice President & CIO
Owens-Corning Fiberglass Corporation

Owens-Corning, a $3 billion company with 17,000 employees in more than 30 countries, has embarked upon an aggressive strategy to implement a global IT architecture to improve enterprise information availability, enhance business processes and increase productivity. Ultimately, Owens-Corning adopted a selective outsourcing strategy to divert resources from legacy technologies and to fund new ones. Radcliff will discuss how Owens-Corning is addressing a number of cross-functional, psychological and inter-organizational issues.

9:30am–10:15am

The Sociopathology of Internet Commerce



Einar Stefferud
Chief Visionary
First Virtual Holdings Inc.

Having a network can be more of an affliction than a blessing. Without a network, localities can operate without dependence on other localities. With a network and the rapid exchange of information among localities, dependence levels and interference levels increase. Local processes must mesh with and interwork with those other localities. This reaches its extreme on the Internet, a collection of more than 58,000 networks. Stefferud will explore how the Internet can function in our newly open telecommunications market, who sets the ethical standards for doing business on the Internet and if this behavior is socially pathological.

10:15am–10:30am

Coffee Break

10:30am–12:00pm

One Customer at a Time: The Future of Marketing

Don Peppers
President
Marketing 1:1

IT is changing the very dimension of business competition — from traditional, product-centered competition to customer-oriented, one-to-one marketing. Peppers will dramatically weave together the various capabilities that IT has given businesses, from tracking millions of customers individually to communicating with them interactively, as well as customizing processes to individual specifications. These capabilities have resulted in a vision of the future that is compelling for any CIO trying to come to grips with the new psychology of IT.

12:00pm–12:15pm

Summary

CONCURRENT SESSIONS

Each Corporate Host will provide a concurrent session, which will be offered twice. You will be able to attend a maximum of four sessions.

Case-in-Point Live! Success Stories for Data-Preneurs on Putting the New Mind Set Into Action

Donald P. Hinman, PhD
Business Development Executive
Acxiom Corporation

Stimulate your thinking by interacting with practitioners of the new IT mind set — innovators who have transformed data resources into winning business solutions. This session will explore the learning and change processes they have gone through to meet and surpass their IT goals. This session, drawn from Acxiom's new reference center, Case-in-Point, will help you meet the challenges of understanding and leading data-based innovations for your organization.

Distributing Data Across the Enterprise: A Decision Process Overview

Stuart Cerullo
Director
Application Development
ITT Sheraton Reservation Corporation
Courtesy of Amdahl Corporation

This session will explore whether distributed systems are the optimal solution for providing enterprise-wide access to information. It will discuss ITT Sheraton's Central Reservation System project, focusing on cost/benefit evaluation, tools available for reengineering mission-critical, mainframe-based, enterprise-wide, client/server environments and retraining and benefits of RAD/JAD best practices.

Customer-Driven Transformation: Designing Integrated Global Solutions

Ron Fowinkle
Vice President & CIO
AT&T Global Information Solutions

Today's CIO has two singular preoccupations — customers and systems. To better serve customers, CIOs must reorient MIS to the competitive environment of maturing industries, global competition and highly segmented markets. For AT&T GIS, achieving this transformation meant global analysis of external customer requirements, joint application efforts, innovative collaboration with third-party software providers and a unique knowledge center application for dispersed information sharing.

Managing Production Quality Client/Server Networks

Jim Goetz
Director
Network Management
Bay Networks, Inc.

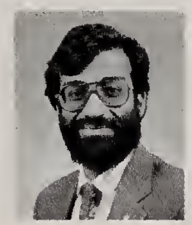
This discussion looks at the economics involved in managing a production-quality client/server network and the key IT challenges facing CIOs trying to build and run highly effective network-support organizations. Goetz will explore the key technologies and design issues that must be considered early in an organization's life cycle in order to ensure a manageable network infrastructure. He will provide clear guidelines for planning and funding projects.

Switching: The Road to Virtual internetworks

Gordon C. Saussy
Vice President
Product Marketing
Chipcom Corporation

Enterprise Local Area Networks (LANs) are expanding to incorporate more and more high-speed switching technology. LAN switching is a well-known solution for LAN congestion and overload, and has been utilized extensively in large networks to microsegment existing LANs and provide high-speed server interfaces. This session will discuss the "Virtual Internetwork" and describe how new ATM and Layer 3 Switching technologies will redefine enterprise internetworks.

Client/Server Computing: Who's Getting it Right?



Yogesh Gupta
Senior Vice President
Systems Management
Product Strategy
Computer Associates International, Inc.

This session will present case studies and the latest research focusing on the migration to client/server, and offer the practical steps to get there. This knowledge has been incorporated, along with CA's years of expertise in business computing, into a pragmatic methodology that allows you to build and manage a client/server environment specifically suited to your organizational environment.

Concurrent Sessions continued ➢

A Survival Guide to Managing Continuous Change

Jose Leruth
Director
Strategic Alliances
Data General Corporation

In the past, taking advantage of technology transitions meant replacing not only the hardware but systems software, systems management tools and applications. Although hardware costs have dropped dramatically, the costs of software and retraining have not. How can CIOs sort through the plethora of computing options and implement new technologies with minimum disruption and cost to the enterprise? This session will provide strategies for surviving in this changing world.

Walking the IT Tightrope: Balancing Life Cycle Costs, Business Needs & Evolving Technologies

Thomas L. Thomas
CIO
Dell Computer Corporation

As information technology evolves, the costs associated with operations, administration and support can skyrocket if not effectively managed. Organizations that have adopted a life-cycle cost philosophy are better equipped to meet their global business needs while leveraging the most applicable technologies. Thomas will discuss the challenges of walking the IT tightrope and will share examples of how Dell and other major corporations have successfully utilized a life-cycle cost philosophy.

Reengineering the CIO Mind Set

Phil Andrews
Manager
Strategic Business Initiatives
EDS

CIOs are encountering challenges and forces that are dramatically reshaping their profession, from megatrends in the business and technical environments to interesting perceptions regarding the CIO's role. CIOs need to understand their fellow executives' business perspectives and mental models. This involves modifying one's behavior as an executive and adapting a proactive approach of the role of information/knowledge and its strategic uses within the enterprise and the outside world. This session will discuss the key aspects of mind set reengineering and its impact on CIOs.

Knowledge Management at CompUSA: A Real-World Application

Arlene Honbo
Partner & Area Director
Ernst & Young LLP

James Infinger
Vice President & CIO
CompUSA, Inc.

For too long, CIOs have focused on the tactics associated with the complex task of successfully deploying IT within organizations, while failing to focus any substantive attention to the issues around information itself. To be successful chief *information* officers, CIOs need to define what information actually is, how it is used and how it brings value. Realizing that knowledge is one of its greatest assets, CompUSA has addressed the issue of knowledge management head on. This presentation will focus on knowledge management at CompUSA — a real-world situation.

Touching the Customer: Leveraging Decentralized Computing to Achieve a Customer Service Edge

Craig B. Lashmet
Partner, Advanced Technology & Client/Server Practice
Grant Thornton LLP
Courtesy of Gupta Corporation

Getting closer to the customer is essential to survival. Leveraging decentralized application systems can help you reach out to your customers (and users) and achieve faster customer responsiveness and higher satisfaction. But how do you effectively synchronize information between centralized mainframe, regionalized servers and remote users? Lashmet will present a case study of a highly successful customer-service and loan-origination system that provides a competitive edge by reducing operating costs while increasing user productivity and customer satisfaction.

Creating a Shared Vision: The New Leadership Role of the CIO

Glenn Osaka
Worldwide General Manager, Professional Services Organization
Hewlett-Packard Company

To be successful in the new information technology era, the IT professional must provide strong leadership to create a shared vision of IT with the business management team. He or she must also assess the readiness and commitment of the organization's senior management, IT management and workforce to support and endure the change needed to deliver on this vision. Osaka will highlight the opportunities and pitfalls that IT managers face in meeting this challenge and will share practical approaches for winning in this new environment.

Concurrent Sessions continued ➢

The IT Puzzle: Making the Pieces Fit

Dave Morehead
Director of Research
Hyperion Software

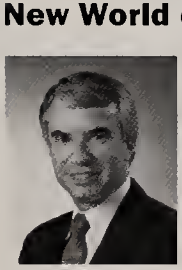
Part of the CIO's new mind set involves dealing with the rapidly changing nature of both technology and technology providers. A single-vendor implementation is no longer viable for most enterprise client/server hardware or software projects, yet a multivendor solution may require constant IT management and oversight. How do you make the various pieces fit? In this session, learn how best-of-class applications and multivendor technology are successfully integrated to provide a seamless solution to mission-critical business issues.

The Olympic Games as an IS Consumer

Mark P. Ryan
Project Manager
Chief Architect
Large Systems Design and Integration
1996 Atlanta Centennial Olympic Games
Courtesy of IBM Corporation

The largest televised event in this century, which will be seen by approximately four billion people, requires a significant computing infrastructure. The large systems design for the '96 Olympic Games production applications includes client/server hardware, operating system software, transaction processing, database-to-database transfer and end-user application performance, reliability and availability. This presentation will explain how the process started, what the Olympic application requirements are and how they are being addressed through an architected client/server design.

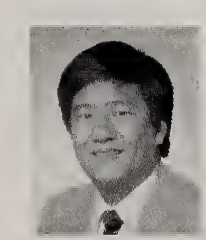
Info-Surfing on a Parallel Sea: The New World of Relational Systems



Geoffroy T. Roach
Director
Tools Marketing
Informix Software, Inc.

Multiprocessor and clustered hardware architectures allow businesses to process an unprecedented amount of raw data — *and* conduct real-time, ad hoc analysis of that data. The improvements in *quantitative* performance are creating *qualitative* changes — including the information superhighway, linking people, ideas, images and sounds. This will lead to an age of "info-surfing," with knowledge workers throughout the enterprise able to access mission-critical data, create breakthrough applications, and help their companies gain and maintain a competitive edge.

Harnessing Innovation & Capturing Best Practices: The CIO's Guide to Process Management



David Hsieh
Vice President
Worldwide Marketing
LBMS, Inc.

The technology every CIO wants is one that replicates expertise and competence across the staff. If an organization only had more "super-hero" developers, it could dramatically improve productivity, delivery quality and consistency. Bringing in contract staff is a short-term solution, and bringing new people on board creates more turmoil. This session describes proven strategies for harnessing innovation, capturing best practices and driving out mistakes across the enterprise through process management.

The "Virtual Expertise" Organization

Joseph R. Cleveland
President
Enterprise Information Systems
Lockheed Martin Corporation

Lockheed Martin is leveraging its IT resources to enable a successful merger of the two corporations. The result is a "virtual expertise" organization which identifies cost efficiencies and helps the corporation attain strategic advantages in the marketplace. Cleveland will discuss the organization's concept and the new paradigms Lockheed has adopted to shift the organizational thinking to assure success.

The New Model of Information Implementation: The Resolution of the CIO's Dilemma

Sheldon J. Laube
Executive Vice President & Chief Technology Officer
Novell, Inc.

Information systems must be the link to suppliers, distributors, value-added partners and, most especially, customers. This session will put forth a pragmatic business and IT implementation model that addresses the future needs of information deployment. Laube will present Novell's Business Implementation Model for the '90s, which lays the foundation for the planning and deployment of information anytime, anyplace.

Concurrent Sessions continued ➣

Communications as an IT Tool

Richard L. Baker, PhD
Chief Scientist
PictureTel Corporation

IT professionals must deliver bottom-line business value and provide the latest competitive-edge solutions, all at an accelerated pace, with right-sized, reorganized resources. This session will examine how videoconferencing, from the conference room to the desktop, can help meet this challenge and will include real examples of how teams can pull together to deliver on time, on budget.

CIOs Need a Shrink

Paul Lawryk
Group Manager
Market & Account Development
North America
Sun Microsystems, Inc.

Thornton May
Vice President
Research & Education
Cambridge Technology Partners

This session will provide an overview of the three stages of growth that major corporations experience when implementing and evolving into large-scale client/server applications and how those growth stages have evolved. The session will also discuss how dysfunctional personalities in the workplace pose a very real threat to the CIO's career and his or her ability to manage through these stages of growth.

Structuring IT for Component-Based Development

Jodie N. Ray
CIO
Senior Vice President
TI Software Business
Texas Instruments

The businesses within Texas Instruments, as part of their business-process reengineering efforts, are driving multidimensional changes within the internal MIS organization. TI's journey from business need to concurrent business/IT reengineering have resulted in such changes as the reorganization of IT to support rapid provisioning of solutions, establishment of architectural principles and a vision leading to component-based development.

Ilie Nastase will lead a tennis clinic and round robin, courtesy of Computer Associates International, Inc. on Monday afternoon.

COMPANION PROGRAM

Sunday, October 15

3:00pm–7:00pm
Conference Registration

7:00pm–9:30pm
Welcome Reception & Registration

9:30pm–12:00am
Hospitality/Networking

Monday, October 16

9:00am–10:00am
Tone and Stretch

10:00am–11:00am
Companion Breakfast

12:00pm–1:30pm
Luncheon with conference participants

1:00pm–5:30pm
Optional: Splendid China Tour
(Advance registration & payment required)

6:30pm–9:00pm
Reception/Dinner

9:00pm–12:00am
Hospitality/Networking

Tuesday, October 17

7:15am–8:00am
Breakfast with conference participants

12:30pm–1:30pm
Luncheon with conference participants

3:30pm–5:30pm
From Information Systems to Learning Processes: The Challenge for Fundamental Change
Peter Senge

5:30pm–6:30pm
Reception with Peter Senge

6:30pm–12:00am
Hospitality/Networking

Wednesday, October 18

7:00am–8:00am
Breakfast with conference participants

Corporate Hosts

ACXIOM

Acxiom Corporation builds data warehouses for clients whose business depends on scope, accuracy and accessibility of customer information. Using a unique matrix of services, software and tools that transform data into customer knowledge, multiple internal databases are integrated with external information to drive powerful, knowledge-based decision support applications. With expertise in industries such as retail, banking/finance, insurance and telecommunications, Acxiom helps clients better understand their customers, build effective acquisition and retention programs, reduce response time and improve customer service.

amdahl

Founded in 1970, **Amdahl Corporation** is a leader in developing and integrating large-scale computing systems and enterprise wide solutions that address the business and information needs for leading organizations worldwide. Amdahl's key businesses include large-scale mainframe computers, UNIX system software and servers, data storage subsystems, data communications products, applications development software and a variety of educational and consulting services. Amdahl products are sold in more than 30 countries for use across all types of computing environments.

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The Merged Company of SynOptics and Wellfleet

Bay Networks is a leading worldwide supplier of a full range of highly available multiprotocol routers, intelligent hubs, high-speed switches and sophisticated network management products. The company's comprehensive network-management application, Optivity Enterprise, is a complete, easy-to-use, integrated solution for enterprise wide systems management. Bay Networks was established in October 1994 with the merger of SynOptics and Wellfleet and now has revenues in excess of $1 billion for its most recent year.

CHIPCOM™

Founded in 1983, **Chipcom Corporation** designs, manufactures, markets and services fault-tolerant intelligent switching systems, including hub, internetworking and network-management products for remote-site, campus and enterprise network computing environments. The Southborough, Mass.-based company reported record revenue of $268 million for its 1994 fiscal year, which ended Dec. 31, a 67% increase over 1993 revenues. Together with its resellers, Chipcom has a presence in more than 40 countries, and the company employs over 925 people worldwide.

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Computer Associates International, Inc. is the leading independent software company in the world. CA develops, markets and supports integrated systems-management, information and business-applications software for a broad range of mainframe, midrange and desktop computers. CA serves the international marketplace through direct operations in 29 countries.

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Data General Corporation is an open-systems company specializing in commercial servers, storage products and services for information systems users worldwide. Our high-availability AViiON servers, DG/UX operating system and CLARiiON storage products form the foundation for large-scale enterprise computing. This foundation, coupled with software from our strategic partners, delivers a complete business solution. And, Data General's professional and systems-integration services pull it all together, to ensure a smooth installation and implementation.

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A Global 500 company, **Dell Computer Corporation** designs, develops, manufactures, markets, services and supports a complete line of personal computers compatible with industry standards. Dell is the world's leading direct marketer of personal computers and one of the top five personal computer vendors in the world. With headquarters in Austin, Texas, and 16 international subsidiaries, Dell products and services are now available in more than 120 countries worldwide.

EDS

EDS works with customers ranging from small companies to the largest corporations and governments throughout the world. EDS is in the business of helping them transform market demands into results and business dreams into reality. To achieve this, we offer the insight that allows customers to imagine what's possible through the creative application of information. We then provide the insight to help them realize what's possible. Quite simply, we work side by side with our customers, helping them use information to do extraordinary things.

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Ernst & Young LLP is the leading integrated professional services firm in the U.S. and among the largest in the world. Our management consulting practice is a leader in business process reengineering, performance improvement and information technology. To increase the speed and quality of our service delivery, we have invested in the Ernst & Young Center for Business Innovation™, which leads the industry in new ways to empower business through people, process and technology. Also, our Center for Business Transformation and Center for Business Knowledge focus on the development of process management tools and a best-practices database, respectively.

GUPTA

Gupta Corporation, a client/server pioneer, continues to innovate with open tools and components for application development and deployment. As corporate information management moves to support business process decentralization, Gupta is leading the market to a new component-based development model. Through more than a decade of steady growth that saw 1994 revenues exceed $64 million, Gupta has raised the ceiling of capability and power with open, integrated tools and database products that let development teams rapidly complete critical application projects.

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Hewlett-Packard Company is an international manufacturer of measurement and computation products and systems recognized for excellence in quality and support. The company's products and services are used in industry, business, engineering, science, medicine and education in approximately 110 countries. Hewlett-Packard has 98,600 employees and had revenues of $25 billion in its 1994 fiscal year.

Hyperion
software

Hyperion Software is the software industry's pioneer in client/server financial and accounting solutions for large, multinational corporations. The company's product suite includes a wide spectrum of accounting, management reporting, financial consolidation, budgeting and information access software. Products include *Hyperion Enterprise* for enterprise financial management, *FYPlan* for budgeting and financial planning, and *Hyperion Financials* for corporate accounting. With more than 2,000 corporate customers, Hyperion is ranked third in the client/server accounting market by IDC. The company was formed as IMRS in 1981.

IBM®

IBM Corporation is the world's leading manufacturer of information systems. It is also one of the world's largest software producers. Based in the United States, IBM does business in virtually every country in the world and is among the leading companies in each country. IBM designs, develops, manufactures and distributes information technology solutions that include everything from subnotebook-size personal computers to the largest supercomputers. These hardware solutions are enhanced through the company's comprehensive software, service and maintenance offerings. IBM provides solutions to information-management challenges and gives customers significant competitive advantage.

INFORMIX

Informix Software, Inc. is the leading supplier of high performance, parallel processing database technology for open systems. Informix's database servers are the number one choice of hardware manufacturers for publishing Transaction Processing Council benchmarks for UNIX-based systems. Informix products also include development tools for creating client/server production applications, decision support systems, ad-hoc query interfaces and connectivity software that allows information to be shared transparently from PCs to mainframes within the corporate computing environment.

LBMS

LBMS, Inc. is a leading provider of process management tools for Fortune 1000 organizations. The company's products leverage benefits of workgroup computing and open partnerships to address the complex demands of application development in organizations with heterogeneous computing environments. LBMS' products can be used individually, as components in a mixed-vendor client/server environment, or together in a seamless application development toolset. LBMS tools operate in an open LAN server-based repository system ensuring consistency, integrity and completeness in the application development process.

LOCKHEED MARTIN

The new **Lockheed Martin Corporation**'s Information and Technology Services Sector has emerged as the business and technology solutions partner of choice for customers who demand competitive, value-added innovation. With $4.5 billion in sales and 35,000 employees worldwide, the technology arm of the corporation provides large, sophisticated information processing systems, systems management and complex systems integration for commercial, government and military customers. Key markets include health care, energy and utilities, interactive systems/virtual reality, identification, factory automation and consulting services.

NOVELL®

Novell's business is connecting people with other people and the information they need, enabling them to act on it anytime, anyplace. Novell is the world's leading network-solutions provider. The company's software products provide the distributed infrastructure, network services, advanced network access and network applications required to make networked information and pervasive computing an integral part of everyone's daily life.

PictureTel

PictureTel Corporation, the world leader in videoconferencing technology, is "redefining the way the world meets." The company develops, manufactures and markets a full range of visual communications solutions from the desktop to the auditorium, supported by offices in over 100 cities in 50 countries. To provide products and solutions that are in step with the strategic technologies of the '90s, PictureTel is working with the leaders in computing, telecommunications, software and the most respected organizations in a variety of vertical markets.

Sun

Sun Microsystems, Inc., founded in 1982, is a Fortune 120 company and a pioneer in the general-purpose workstation market, having launched the now popular concept of open systems. Sun's client-server computing solutions include networked UNIX workstations and multiprocessing servers. According to analysts, Sun ships more UNIX systems worldwide than anyone.*

**Source: International Data Corporation*

TEXAS INSTRUMENTS

Texas Instruments, Inc. provides a broad range of business and information technology products and services that allow companies to quickly respond to market dynamics. TI's application-development software product, Composer by IEF™, uses model-driven development to rapidly design, build, test, install and maintain client/server and terminal-based business applications for a wide variety of platforms and databases. Composer is the newest generation of TI's industry-leading IEF for Client/Server. The world's largest companies generate applications with Composer to add competitive advantage and enable change within their information systems.

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Please print and complete this form in its entirety, then forward to the attention of Executive Programs. **Fax** *to 508-879-7720.* **Call** *us at 800-366-0246.* **Mail** *to: CIO Communications Inc., 492 Old Connecticut Path, Framingham, MA 01701.*

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○ **IS Practitioners/Executives**
If you are a CIO, IS executive or hold another executive position, the fee is **$1,395**.

○ **Government/Military**
The fee, which includes your hotel for three nights, is **$1,695**. Do not make your own hotel reservations. **CIO** will make them for you.

○ **Sales/Marketing/Consulting**
If you hold a sales, marketing or consulting position, the enrollment fee is **$5,000**. **CIO** will make the final determination of this category.

OTHER ACTIVITIES

Monday afternoon activities include:

- ○ Golf Tournament: **$125**
  Golf must be prepaid
  Golf handicap ________
  ○ *Club rental*
  ___ *Left-handed* ___ *Right-handed*
- ○ Tennis Tournament: *Complimentary*
- ○ Splendid China Tour: **$37**

○ **COMPANION PROGRAM ($199)**
Companions must be enrolled in this program to attend any conference-related functions. Includes all scheduled meals, entertainment, morning stretch and companion get-acquainted breakfast. Conference session attendance not included.

- ○ Tennis Tournament: *Complimentary*
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CIO *reserves the right to decline enrollment to any registrant.*

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To hasten the enrollment process, attach business card here.

ATTIRE
Casual! Please, no suits, ties or business attire!

HOTEL ACCOMMODATIONS
A block of rooms has been reserved at the Hyatt Grand Cypress. We urge you to make your reservations early by calling the hotel at 800-233-1234. Be sure to identify yourself as part of the **CIO** *conference to receive the conference rate. Please make your reservations early. All unreserved rooms will be released on 9/20/95. Hotel reservations/cancellations and charges are your responsibility.* ***CIO*** *will make hotel reservations for government/military participants.*

TRANSPORTATION
American Airlines is the official conference carrier. Call American at 800-433-1790 and reference Star File #S3905D5. AVIS is the official car rental provider. Call AVIS at 800-331-1600 and reference B766657. Shuttle bus transportation is availabl from Orlando International Airport a the rate of $23 round trip with coupo

ENROLLMENT FEES
All enrollment fees must be paid in advance of the meeting. *Fee includes conference sessions, concurrent sessions, corporate host displays, conference materials and scheduled meals. Transportation, hotel and recreation are your responsibility.*

CANCELLATION
You may cancel your enrollment up to 10/9/95 without penalty. ***NO REFUND OR CREDIT WILL BE GIVEN FOR CANCELLATIONS RECEIVED AFTER 10/9/95.*** *You may send a substitute in your place.*

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THE PSYCHOLOGY OF IT:
THE CIO'S NEW MIND SET

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TRENDLINES

BUSINESS MEETS ACADEMIA

SCALING THE IVORY TOWER

Fast-growth companies that form alliances with universities boast productivity rates 59 percent higher than their peers, but many complain that college professors and administrators don't understand their needs, according to a Coopers & Lybrand LLP study of 424 U.S. firms. Although most growth-company CEOs are satisfied with specific aspects of university relationships, 52 percent cite significant barriers in these collaborations.

That lament may explain why only four out of 10 growth firms take advantage of university resources. In addition, many up-and-coming medium-sized companies are not aware of the resources that universities offer, says Peter Collins, director of entrepreneurial advisory services for Coopers & Lybrand. Companies that do form alliances with universities often encounter an uncoordinated hodgepodge of services. Student-intern office personnel, for instance, may be unaware of the R&D opportunities on campus, Collins says.

Complaints of growth-company CEOs include:

- Faculty cultures are not receptive to business.
- Many universities lack interest in designing programs and resources for businesses.
- Research and technology interests are often inappropriate for businesses.
- Universities have no experience working with growth-oriented companies.
- Course material appropriate for employee training or recruitment is not available.

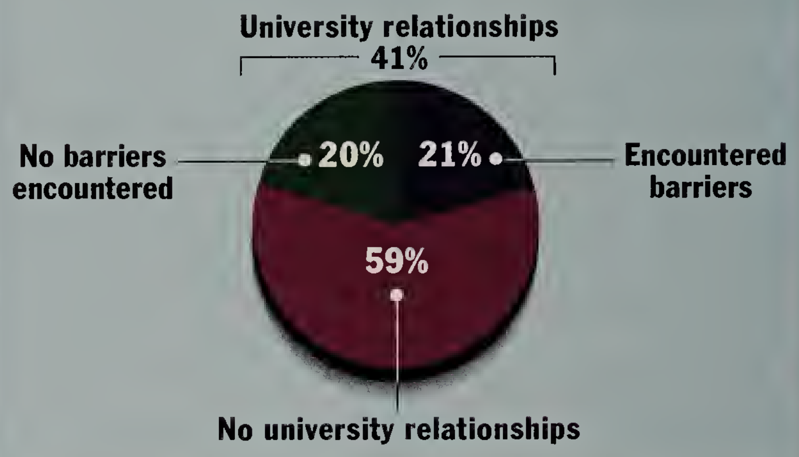
Growth companies with university relationships say they most frequently tap schools for training and recruitment. More than one-third send their employees to nearby universities for training, 70 percent hire student interns for business projects and 40 percent recruit students for permanent positions. Forty-four percent say they employ faculty as technical consultants. Additionally, 17 percent seek faculty advice on business planning and 13 percent call on faculty for assistance with manufacturing technology.

Of the companies that expand their collaborations beyond training and recruitment, 29 percent of the partnerships result in cooperative research and development, 20 percent share laboratory resources and 5 percent license technology to university laboratories.

–Peter Fabris

Business-Academic Partnerships

Only four in 10 growth companies have relationships with universities, and only half of these funtion smoothly



SOURCE: COOPERS & LYBRAND LLP

CHART BY LINDA GOLON

TAXING QUESTIONS

Businesses selling goods and services in the electronic marketplace may find commercial travel on the information highway slowed by tolls in the form of unanticipated sales taxes, according to KPMG Peat Marwick LLP.

As state tax authorities reconsider what constitutes a taxable connection for collecting sales or use taxes from out-of-state businesses in light of the burgeoning electronic marketplace, figuring out what's taxable—not to mention who should collect the tax—gets tricky.

At issue is how states may redefine a company's physical connection to the state, upon which taxing jurisdiction is based. Legal precedent requires a physical connection for states to demand that out-of-state companies collect sales or use taxes. Activities under scrutiny include virtual telecommunications networks that promote out-of-state marketing and financial networks such as credit-card systems that facilitate out-of-state sales.

"States are closely watching the advent of online services—where customers travel in an electronic marketplace to purchase goods across state lines—as a means of expanding a company's taxable connections in a state and its sales tax collection duty," says Michael H. Lippman, KPMG's national partner in charge of state and local tax and technical services. He advises companies to stay on top of states' policies—and to keep detailed records of electronic sales transactions. ■

There's no denying the power of the Internet for disseminating information, and for hate groups it's reportedly becoming the tool of choice. According to the League for Human Rights at B'nai Brith Canada, a Jewish advocacy group, use of the Net helped increase the number of anti-Semitic incidents in 1994, despite the overall decline of organized hate groups.

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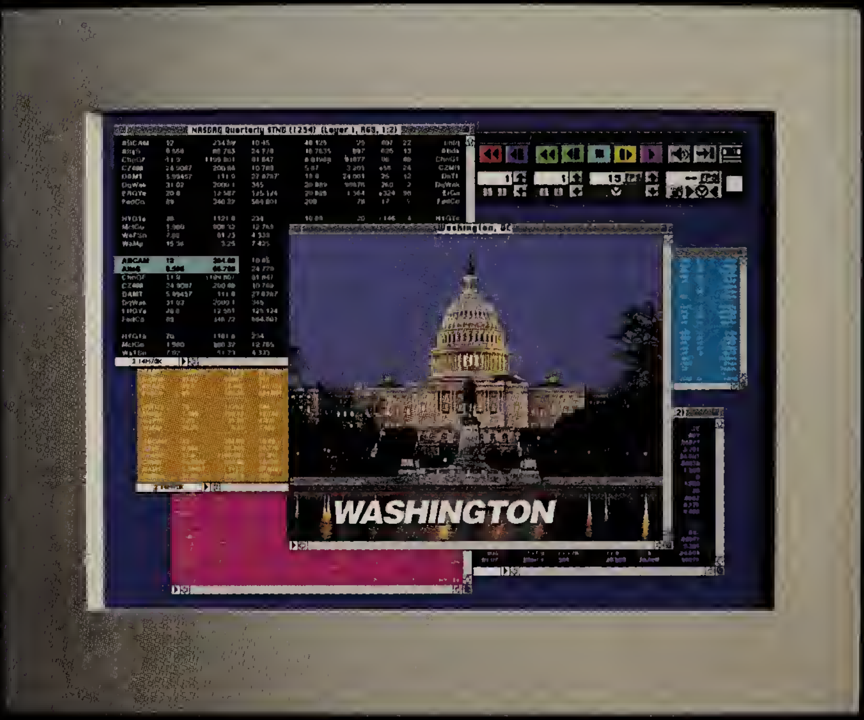
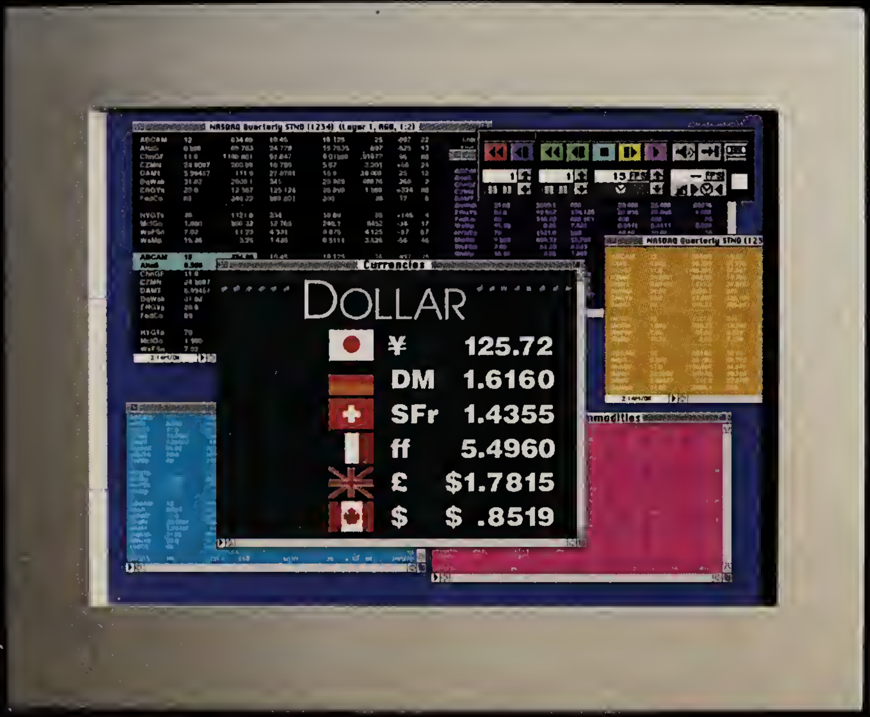
HOW WALL STREET'S SMARTEST BROKERS MAKE SURE THEIR INVESTMENTS NEVER GO DOWN





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TRENDLINES

ONLINE SOFTWARE PIRACY

AVAST, YE SCOUNDRELS

Just as seafaring pirates have switched from wooden sloops and frigates to high-speed, radar-evading fiberglass boats, software pirates are adopting the latest technology trends, moving from illegally duped disks to clandestine downloads from online, Internet-based services. The Business Software Alliance (BSA) is receiving more and more piracy hot-line calls involving unlicensed software that can be traced to illegal downloads. In a recent case involving an electronic bulletin board service (BBS), more than $1 million in copyrighted software was downloaded illegally in a two-week period. More than likely, some of that software landed in a corporate environment—maybe even yours.

The growth of the Internet enables millions of people to exchange information and communicate quickly and inexpensively. However, the Net also makes the unauthorized distribution of copyrighted material easier. With the Internet, pirated software can be sent to people on opposite sides of the world as easily as to an adjoining office, thus erasing geographic barriers and exponentially expanding the customer base for pirated software. With thousands of BBSs operating internationally around the clock, potential losses due to online piracy are staggering.

Many organizations require all incoming software to go through the IS department to prevent unlicensed copies from being brought in from home or elsewhere. However, when employees gain access to the Internet or a BBS from their own workstations, the company loses some of its ability to guard against software management policy infractions. Because piracy on a BBS or the Internet is a faceless, electronic transaction, employee access to online systems can be a Trojan horse from the perspective of those who attempt to enforce copyright compliance. While organizations should not alter plans to introduce online technologies for fear of software piracy, CIOs must consider how online computing will affect their ability to enforce software copyright laws and modify their policies accordingly.

Industry strategies for dealing with online piracy are evolving. Law enforcement agencies are getting more involved; between 1992 and 1993, the number of hours FBI agents dedicated to software piracy increased more than 400 percent. The FBI and the Department of Justice are expected to continue increasing the amount of time devoted to the investigation and prosecution of criminal copyright infringement.

ILLUSTRATION BY PHILIP ANDERSON

CAREER MOVES

JACKIE RIBICH was appointed CIO for AT&T's Chief Financial Officer organization. Ribich is now responsible for the financial information technology and systems of the telecommunications and computing corporation.

Fleet Mortgage Group Inc. recently appointed ANTHONY B. CARDOZA as its executive vice president of information technology and chief information officer. Cardoza's responsibilities include the company's front-end loan-origination system project as well as managing the IS division.

KATHY BRITTAIN WHITE was named CIO at Baxter Healthcare Corp. White is responsible for developing a strategy for systems development, hardware acquisition and integration that will meet Baxter's long-term information needs.

GENE CORT has been named CIO at Ernst & Young LLP in New York. Cort, who joins E&Y from Lotus Development Corp., will oversee the company's U.S. information management infrastructure.

DOING AS WE SAY

After nearly eight years of reporting on what CIOs need to know about IT and business, we've hired our first CIO, Bruce Friedman *(friedman@cio.com)*. Friedman comes to us from KPMG Peat Marwick LLP, where he was director of IS. And since we recently launched *WebMaster* magazine, we thought that while we were at it, we'd also hire our first webmaster, Tim Horgan *(thorgan@cio.com)*. A frequent speaker at Internet conferences, Horgan is the former technical director of Digital Equipment Corp.'s Web Services Group. He will oversee CIO Communications Inc.'s new Web site *(http://www.cio.com)*. ■

U S WEST Communications Makes the Right Connections

Winner of the 1995 Enterprise Computing Award
SAS Institute Inc.
Enterprise Computing Award
U S WEST Communications
For organizational excellence in enterprise-wide information delivery
1995

Calling on the SAS® System for Critical Decision Making, the Telecommunications Leader Responds to Customers in More Ways than Ever

To meet the needs of 25 million customers spanning 14 states, U S WEST Communications is doing more than talk about customer service. It's *listening*— and transforming business processes to monitor every facet of customer interaction. Part of this transformation involves collecting, analyzing, and reporting on massive amounts of data—everything from daily call volume to disruptions in nearly 45 million miles of copper/fiber communication lines.

"Until recently, various organizations and systems within U S WEST Communications were responsible for portions of the data collection, reporting, and analysis tasks necessary to assess the performance of our business," says Ronald Telson, Director of Mass Markets and Operations-Processes. "We are now implementing a program to provide an integrated and unified approach to management-by-facts."

The Data to Meet the Demand

When it came to choosing the software to meet that business challenge, U S WEST Communications called on the SAS System of software. More than 28,000 companies throughout the world rely on the SAS System for its analytical breadth as well as its capabilities for data warehousing, for client/server applications development, and for graphical user interface—all of which U S WEST Communications found useful.

As a result, U S WEST Communications expects to achieve a key business goal—to monitor the quality of its processes and the health of its network.

That's why we've chosen them as the 1995 recipient of our Enterprise Computing Award—given annually to the organization that best exhibits excellence in leveraging SAS Institute technology to meet critical business goals.

To learn more about the SAS System, call or send for our free Executive Summary. Or to learn how your organization might qualify for the 1996 Enterprise Computing Award, ask for our free criteria.

SAS Institute Inc.
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URL: http://www.sas.com/
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TRENDLINES

In the meantime, it's incumbent upon the IS department to make itself and the user community aware of the potential for copyright abuse presented by the introduction of online computing into the organization. Having U.S. marshals arrive at your door unannounced is an awfully unpleasant way to learn about online software piracy. For a free copy of the BSA's *Guide to Software Management* or to report software piracy, contact the BSA at 800 688-BSA1 or at *http://www.bsa.org/bsa*.

–Robert Kruger

A former federal prosecutor in Washington, Robert Kruger is the director of enforcement for the BSA.

SECURITY BLANKET OR WET BLANKET?

Maybe you can never be too rich or too thin. But according to a recent report from Forrester Research Inc. of Cambridge, Mass., it's quite possible to go overboard on protecting your company's information. The report concludes that the mainframe security model—locking down data by default and opening it only on a need-to-know basis—costs companies a fortune in this age of open systems and distributed computing.

According to Forrester, excessive security lowers companies' return on technology in three ways. First, it dooms reengineering efforts in which cross-departmental teams must analyze data and processes across the company. Second, it prevents companies from finding and leveraging new business opportunities. And finally, excessive security incurs huge administrative costs on top of dollars spent on tools.

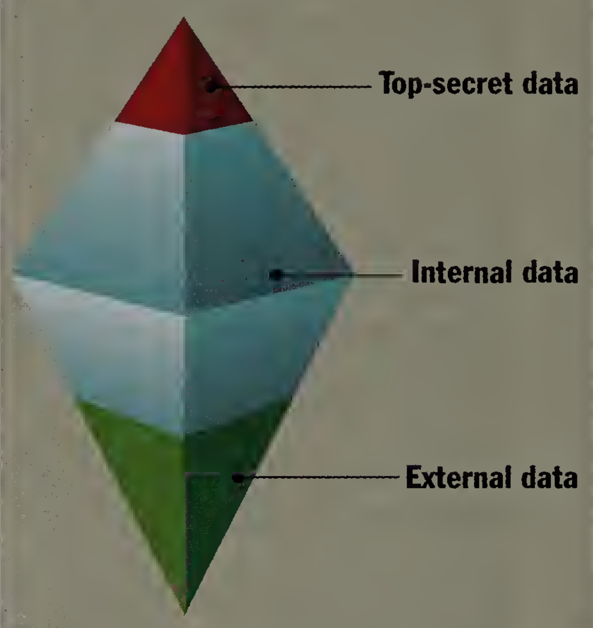
Forrester maintains that a higher return on technology can be achieved by freeing information and making it available to employees and customers. "The biggest opportunity for companies today is in using technology to make customers happy," says Waverly Deutsch, analyst for Forrester's Computing Strategy Service and author of the report. Activities such as putting marketing materials on the Web, letting customers place orders online and consolidating account information for customer service representatives all involve greater access to information, she explains. "Security needs to be applied to make sure that the right people have access—not to lock down individual bits of information," Deutsch says.

Forrester advocates a three-tiered security architecture in which information is divided into top-secret data, internal data and external data that can be shared with customers. The key is to determine what really is top secret. "This isn't a proclamation to throw out security tools," says Deutsch. "In fact, several security layers should be applied to top-secret data. The idea is to make companies use security tools more cost-effectively, while empowering employees with more raw material and, in the process, making more money."

For more information, contact Forrester at 617 497-7090.

A Three-Tiered Security Model

Relatively little data is really top-secret.



SOURCE: FORRESTER RESEARCH INC.

CHART BY LINDA GOLON

EUREKA SEEKER

Every week, the U.S. Patent Office publishes a dictionary-sized book containing the first page of more than 2,500 new patents. Tracking competitors or technology trends once meant leafing through this tome, sending $3 to Washington for each patent requested and waiting one to three weeks for the documents to arrive by mail. But now a complete library of every U.S. patent document issued since 1976 is available on the World Wide Web.

MicroPatent's Internet Patent Server *(http://www.micropat.com)* is an automated system of jukeboxes containing more than 1.5 million U.S. patents on 3,000 CD-ROMs—over 2.2 terabytes of data. The server allows users to search through and read the full text of recent U.S. patents for free; new patents are available within 48 hours after they are issued. Users can also preview for free the first full page—which often includes critical diagrams and line drawings—of any U.S. patent issued in the last 19 years. Virtually instantaneous Internet delivery of the full text and graphics of any patent costs 25 cents per page.

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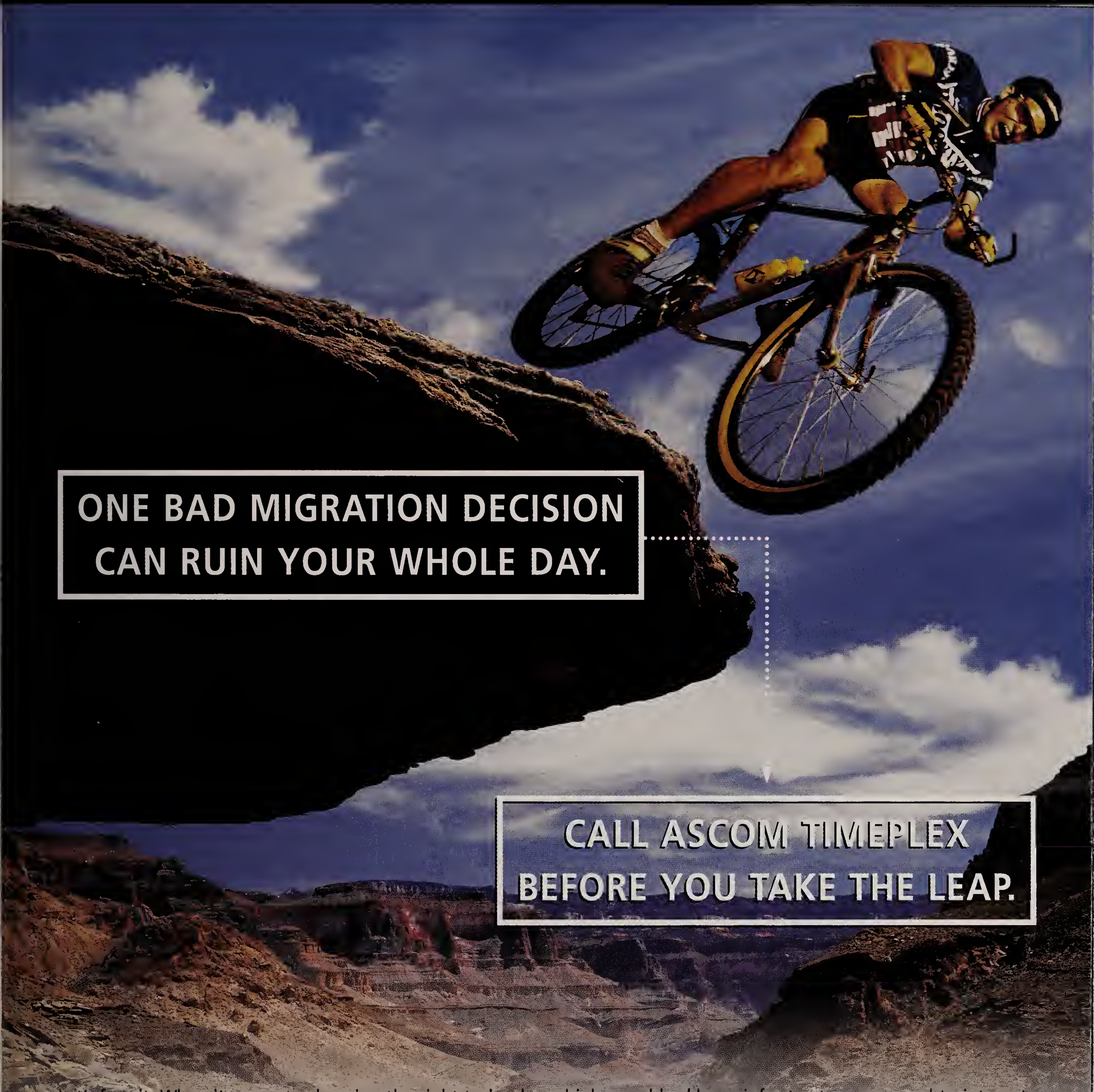
New York-based Applied Business Technology Corp. is calling for nominations for its 1996 Project Leadership Awards. The annual awards recognize North America's best IS project managers. For a nomination form, call 800 477-6532. The deadline for nominations is Nov. 30, 1995.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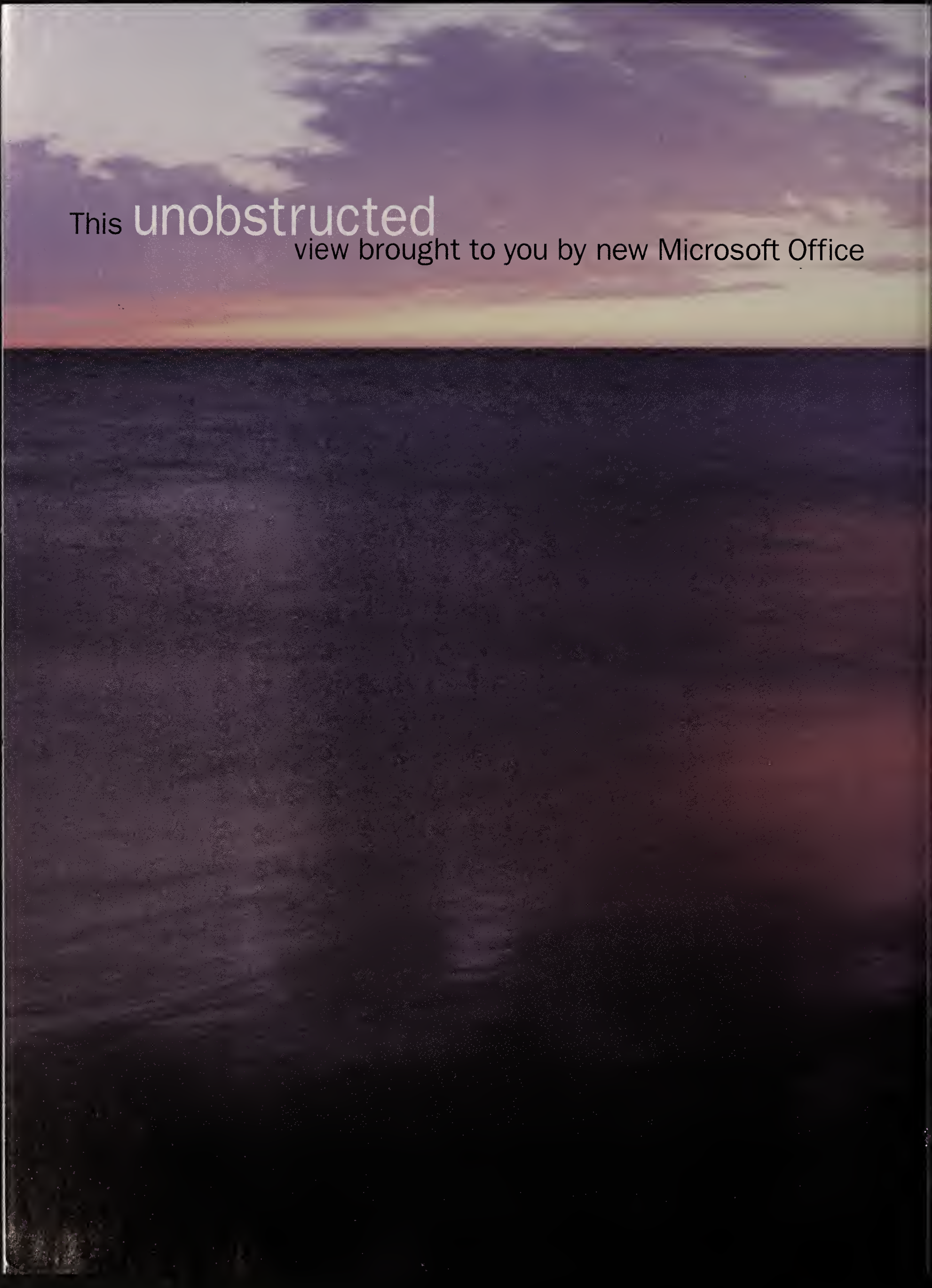
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A Matter of Marketing

If IS departments are to survive, they must not only add value for their customers but also make sure those customers recognize the added value. Most systems groups focus on the first requirement, but the second is even more important.

BY DANIEL E. KLINGLER

It's no secret that IS budgets today are under siege. Why is this so? The answer is simple: a perceived lack of added value.

As a result of this perception, chief executives and CFOs are radically restructuring the IS function and its governance. Outsourcing, decentralization and the replacement of internal programmers with contract systems integrators are all popular tactics in the quest to improve IS, the hope being that someone else knows how to build, deliver and maintain systems better and more economically than the internal IS group does.

These phenomena are undoubtedly threatening to many central IS groups. But are they inherently bad? Probably not. This ground swell is simply mounting evidence of the perception of a serious mismatch between customer needs and IS capabilities and economies. If central IS is to survive, it must meet these opportunities head-on.

Though the cause of this problem is not always clear, the primary challenges are. They are quite simple (but not easy): Do the right things for the customer, and do those things right. Interestingly, most recent IS management trends have targeted the second challenge—doing things right. Project management, systems development methodologies and life cycles, CASE tools and total quality management (TQM), for example, are all focused on performing IS tasks effectively and efficiently. These are certainly necessary conditions for success, but they are not sufficient. There still remains the more fundamental question of whether IS is doing the right things for the customers.

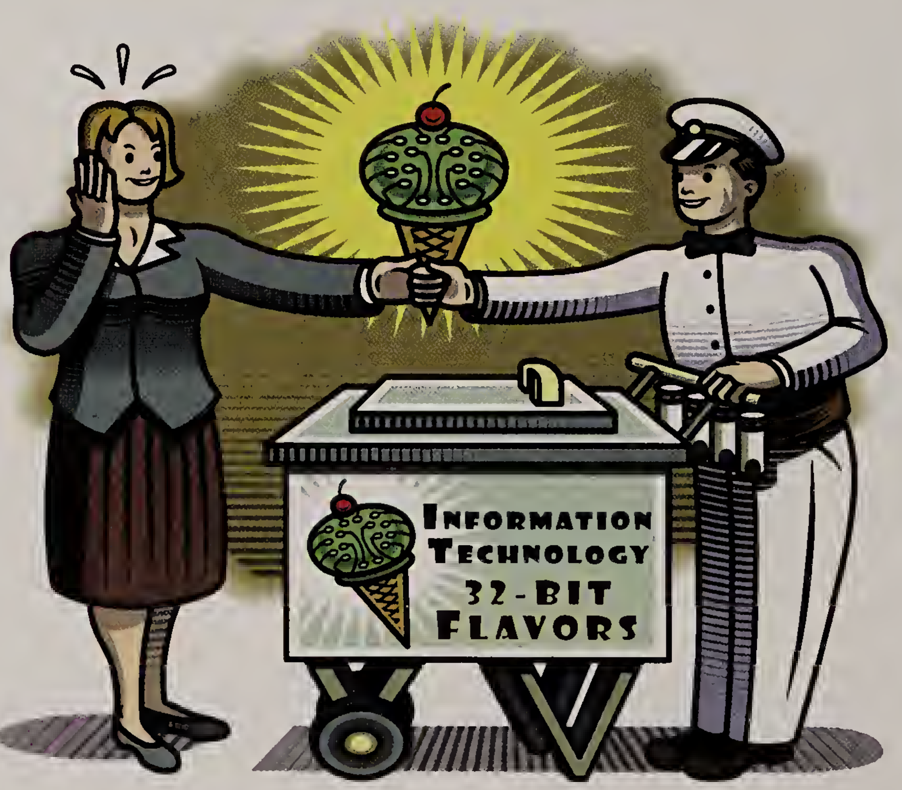

ILLUSTRATION BY PETER HOEY

The continued survival and growth of conventional IS requires that IS must add value for the customer, and the customer must perceive that IS is adding value. Most systems groups genuinely try to live by the first precept; however, the second is even more important. The challenge of doing the right things for the customer is really a classical marketing problem.

Because of the elusive nature of IT products, however, marketing them is not always straightforward. Computing goods and services are for the most part intangible. An example is the data warehouse: If it's done well, users don't even realize the warehouse is there—all they know is that historical information can be plumbed and analyzed.

IS customers don't buy IS; they buy the expectations of the benefits promised by IS. Customer beliefs and expectations can be formed by prior mind-set or experience, vague notions about what technology can and cannot do, and the context within which this is all shaped and delivered. So, computer marketing is about changing attitudes and beliefs.

How can the IS group change customers' attitudes and beliefs concerning the contribution of IS to the

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business? It must choose the correct marketing approach—one that fits the organization's values, culture, customers, products and services.

Four Fundamental Approaches

The most popular marketing approach used by IS organizations today is to not worry about marketing at all—the "Monopoly" approach. It is predicated upon the smug assurance that central IS is the only game in town and the naive assumption that those burdensome technology bumpkins called users desperately need IS and will wake up to that fact eventually. Unfortunately, for most departments operating in that mindset, that day never comes. Instead, users turn to other sources for the technological support they need, bringing on IS's demise.

For IS groups hoping to avoid that fate, there are four fundamental strategies that may be employed:

1. IS-Driven Alignment. The process used here is simply to inventory current IS products and services, then come up with new ways to promote them. The rationale goes something like this: The problem isn't with what we (IS) are doing. After all, we are the experts. We certainly know more about information systems than our customers do. We just have to do a better job of selling what we have to them. If they still don't want our products and services, they must be stupid, and we can't do anything about that.

2. Customer-Driven Alignment. The process driving this approach is usually to do some relatively simple, open-ended market research with the historical customer base. The challenge is then to deliver products and services according to customer specifications, some of which may be novel to the IS group. Hence, this approach can span current and future customer needs.

3. Customer-Driven Transformation. This process challenges IS to do some future-oriented market research with customer visionaries, and then to deliver products and services according to customer specifications. Such market research usually requires a hefty amount of customer education so that they are aware of what is possible with IT. The visionaries then drive the process, with IS along for the ride.

IS customers don't buy IS; they buy the expectations of the benefits promised by IS.

4. IT-Driven Transformation. This process is the secret fantasy of many CIOs. The tricks here are to decide what fancy new technology the customers really need to address an as-yet-untapped business opportunity, sell it to them, then deliver those products and services (though the particular products and services may lack clear customer specifications or demand). If possible, the solution should involve leading-edge—preferably bleeding-edge—technology.

Which to Choose?

Well, which is it to be? Not so fast. The way in which the systems function markets itself must take into account the culture of the host organization. Here are some key questions you first need to ask:

- Are we (IS) in danger of going out of business (i.e., being distributed, outsourced, etc.)? How long can we keep doing what we are doing before we are eliminated?
- Does executive management expect IS—as a classically defined "service and support" staff function—to help create its own markets or simply to respond to them?
- Are we going to focus on the needs of the entire organization or only one facet? Do we intend to service one customer base or several (local, international, departmental, cross-functional)? How do we distinguish those distinct customer sets?
- Should we adopt one marketing strategy or more? What are the organizational implications for us if we tackle more than one? Do we have the resources, especially people with the right skill mix?

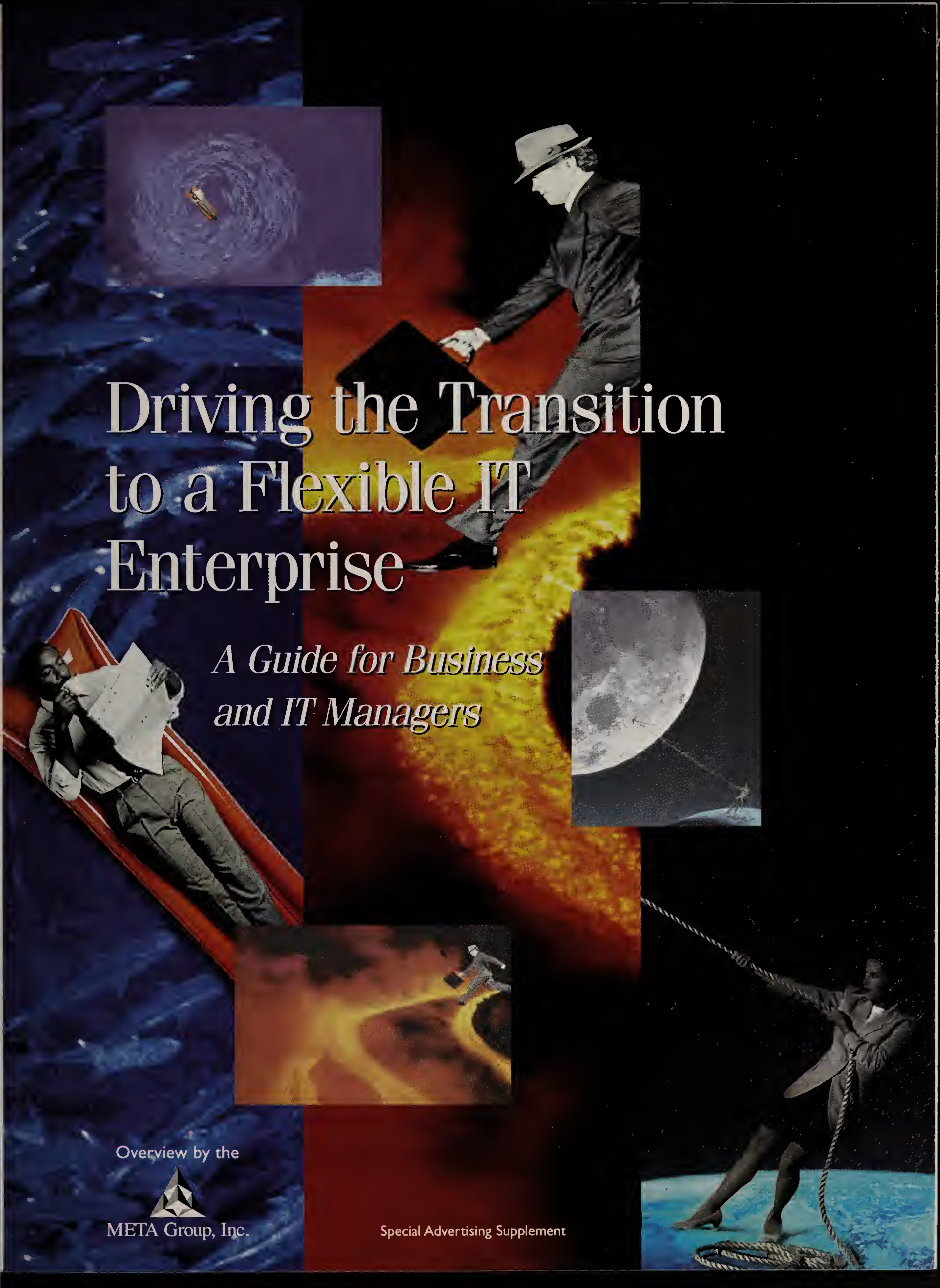
The answers to these questions can help to shape the choice of a marketing strategy or strategies. For example, if the management culture at your company is of the ilk that insists that "IT is simply an overhead cost that must be controlled," options three and four are out of the question. On the other hand, if you've got a bunch of IT-savvy MBAs champing at the bit and your visionary CEO is committed to making the firm's sales and marketing capabilities world-class, option three (perhaps with a dash of four) may be the way to go.

In any case, before making a final choice, it is wise to examine the pros and cons of each approach.

1. IS-Driven Alignment. This could be referred to as Buggy Whip marketing, but might also be called Denial marketing. It is an attractive strategy to many IS groups. It is comfortable, it keeps IS busy, and it provides a rationale for the continued existence of IS. Implementation is essentially risk free because it is based upon promotion of proven IS services and products. The only major drawback is that there may not be a market for the current products and services. In a healthy organization that has made such a choice consciously, this leads to a service posture for IS. In a dysfunctional organization, this is essentially a defensive posture, with a short-term orientation.

The likely long-term outcome is not good. As the adage goes: "If you always do what you've always done, you'll always get what you've always gotten." And you almost assuredly won't be positioned to meet future needs. This "let's make up a brochure" type of marketing may raise customer awareness of the skills, competencies, products and services that IS can offer at present, but it is certainly not customer-centric. Rather, it focuses on the seller and may get IS some more work of the sort it has already done. But it won't position the IS function for the future.

Although this view of marketing is short-sighted and self-centered, many IS groups choose it. IS departments tend to judge themselves based upon their own standards of professional accomplishment rather than those of



Driving the Transition to a Flexible IT Enterprise

A Guide for Business and IT Managers

Overview by the

META Group, Inc.

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The Transition to a Flexible IT Architecture

Beyond the Limitations of Legacy Systems

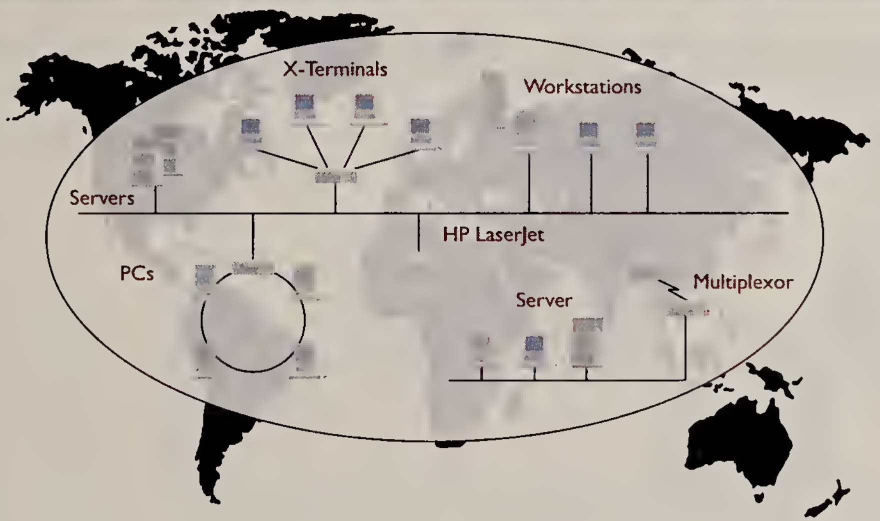
As information technology evolves, virtually every organization is feeling pain from its existing IT resources. Application backlogs are growing. IT operating costs continue to climb. Data on mainframes and proprietary midrange systems is often inaccessible. New product lines — being introduced at ever increasing rates — must be supported. And organizations are continually being challenged to do more with less.

Attributes of the Flexible IT Enterprise

Open Systems
- **for portability and interoperability**

Distributed Capabilities
- **to offer flexibility to distribute computing tasks when needed**

Enterprisewide Data Access
- **to provide transparent access to shared data across multi-vendor environment**



New Role for MIS
- **to manage vendors and to collaborate with end user**

Central Administration
- **to manage the enterprisewide data center**

Client/Server Development
- **to rapidly access and deploy new technologies**

Realizing that proprietary architectures cannot sustain a company's competitive edge, corporations have begun to search for more flexible and responsive IT environments. The result is that open systems and client/server architectures have emerged as the foundation of a more flexible IT architecture. Introducing new technologies into existing legacy environments is now the primary challenge of many IT managers.

Organizations are recognizing the need to transition to client/server, but the transition involves risks. How can an MIS manager ensure that systems, PCs, peripherals, interfaces and development tools will work well together once deployed in a client/server model? How can IT personnel be trained for a new skill set, given that their roles and responsibilities may change during the transition? And how can an organization transform a rigid pre-defined IT architecture that imposes limitations on business processes to a flexible, adaptable IT architecture that supports true re-engineering of business processes?

More Than Technology. Addressing this challenge requires a new view of IT — one that includes not only technology solutions, but also the solutions to the equally critical people and process issues that are part of this transition.

Experienced Transition Advisors

To manage such complexity and minimize the risks requires a comprehensive understanding of the significant changes required in processes, people and technologies. Hewlett-Packard Company has developed this knowledge first-hand.

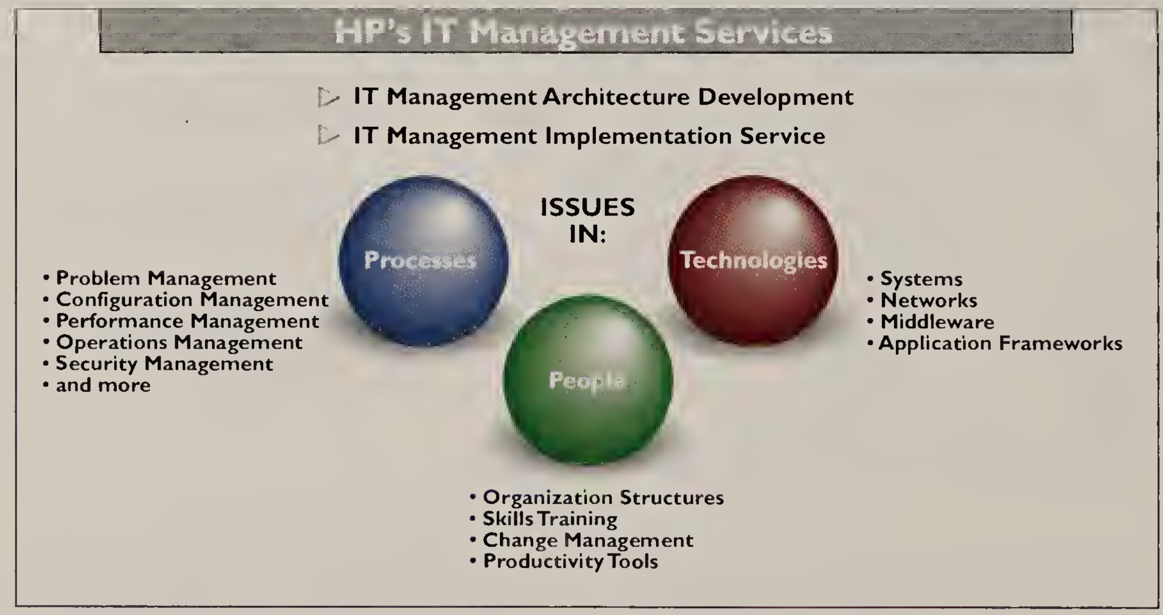
HP, ranked 22nd in the Fortune 500, has helped thousands of companies worldwide transition from proprietary mainframe and midrange platforms to open systems-based client/server architectures.

HP's Mainframe Elimination. HP understands the issues involved because it has been down a similar path itself. The company is driving its own internal mainframe elimination project. For over 30 years the company had large legacy applications deeply entwined within an IBM mainframe architecture.

By 1992 HP had eliminated all but two of its production mainframe data centers. And HP anticipates that by the first quarter of 1996, it will be the largest company in the world to be running its business without traditional mainframes.

The business and technical issues that HP faced in migrating from its own mainframes to more cost-effective, flexible open-systems platforms are the same ones that many other companies are facing.

To address these issues, HP has developed a complete portfolio of services and products to enable a smooth transition for the processes, people and technologies that comprise IT.



Transition Technologies

HP has built a technology foundation supporting the transition from proprietary architectures to open client/server. This foundation begins with the superior performance and scalability of the HP 9000 server, in configurations appropriate for departments or workgroups to data centers.

HP also supports the key applications, multivendor systems, networks and peripherals used in legacy environments. For managing across the IT enterprise, HP developed the industry's leading technology framework, HP OpenView. HP OpenView provides the comprehensive set of management tools, including those offered by the industry's leading software vendors.

Transition Services

Planning, project management and implementation are key elements of a successful IT transition. Experienced consultants can be enormously useful in guiding an organization through an already proven process that addresses each stage of change. HP has provided this guidance for thousands of companies worldwide.

HP's Transition Services Methodology leads organizations through a process to identify business problems and requirements, establish clear goals, evaluate technology options, and finally choose and implement a solution. HP's experience is evident in the kind of questions the consultants know to ask, in the resulting analysis which benchmarks an organization against HP's experience with other companies, and in HP's understanding of the transition process and its recommendations for mitigating transition risk.

Hewlett-Packard is driving its own internal mainframe elimination program. By 1992 HP had eliminated all but two production mainframe data centers. And by the first quarter of 1996, HP expects to be the largest company in the world running its business without traditional mainframes.

Education. To transition people's skills, HP offers an educational assessment service to help define training needs at the outset of the transition and to develop a training plan that takes into account the current proprietary-based skills, providing a bridge from the old to the new.

Software Solutions to Match Different Strategies

Moving Existing Applications. HP's relationships with software providers are a key element of transition success. Some organizations that have offloaded their host-based systems have chosen to convert or transfer their existing applications to Unix. HP offers a full range of conversion tools and traditional mainframe applications to aid in the transition without replacing the applications or existing user interfaces.

Implementing Re-engineered Applica-

tions. Many other organizations, wanting new application functionality, have chosen to replace outdated applications with new and improved packaged software developed on Unix systems. SAP, for one, has been very successful with its R/3 business applications written specifically for open systems client/server architectures, and HP is the leading platform for R/3.

Developing Customized Applications. Another offload strategy is to build highly customized, mission-critical applications in-house by using one of the new advanced development tools. Industry analysts predict that the demand for enterprise-based client/server development tools will explode over the next three years. Antares Alliance Group's ObjectStar enables portions of existing, complex code to be redeveloped for client/server and Dynasty's 4GL products bring new rapid application development capabilities to this emerging market segment. Leaders in the marketplace for traditional client/server development tools, such as Texas Instruments with Composer by IEF and Seer Technologies with HPS, also are expanding into the market for enterprise-based development solutions.

Summary

Effective IT management today demands a flexible, open environment that can guarantee the availability of mission-critical applications, databases, systems and networks. Organizations seeking to remain competitive are driving the transition from proprietary, centralized, often mainframe-based architectures to distributed client/server.

Yet that transition carries with it inherent complexities and risks. Based on the experience of thousands of customers worldwide who have successfully made the transition, its own mainframe offloading project, and a comprehensive portfolio of products and services, HP is in the best position to help reduce the complexities and risks involved in migrating.

By focusing not just on technology, but also on the IT processes and people skills, HP is prepared to guide organizations to a flexible IT enterprise. ●

Rolling Out Enterprisewide Client/Server

One organization where Hewlett Packard is working alongside both the IT and business unit managers to ensure a smooth transition is Chevron Corp. HP is helping Chevron implement a worldwide rollout of SAP's R/3 financial applications. HP is providing systems for all three tiers of SAP's R/3 solution, and open systems training, consulting and support services.

HP's Professional Services Organization (PSO) has been working with Chevron to deploy HP OpenView as Chevron's enterprise network and systems management platform. Chevron's legacy environment, as well as the new SAP application on HP open systems, can both be managed centrally using HP Operations Center, a key component of HP OpenView. This is possible because HP OpenView is integrated with Paradigm/XP, from Computer Associates/Legent Corp., as well as SAP's Computing Center Management System.

Success in Re-Engineering Business Processes

Another realworld example involved the supporting of re-engineered business processes. In this instance, HP's PSO assisted Tokio Marine & Fire Insurance Co. Ltd. of Tokyo in changing its IT infrastructure. The reason for the change was that Tokio Marine wanted to support more efficient processing of its property and casualty insurance data. With processing volume at more than 700,000 transactions per day, the typical 10-second inquiry response time of the mainframe-based system was too slow.

HP's consultants worked with the company to design, manage and implement a project to install an open, standards-based communication backbone to handle the requirements of the re-engineered, large-scale online transaction system.

The results of this implementation are a significant improvement in response time (greater than 50%), a system that is dramatically easier to learn and use, and, most importantly, a communication backbone that will enable Tokio Marine to continue its migration from mainframes to more economical servers in the future.

BY MARC BUTLEIN, META GROUP

IT Management Must Drive the Transition

Reflecting a more competitive market, enterprises are redefining themselves, changing their infrastructures to focus on providing top-quality service to customers. Although nearly every aspect of a business has been affected, the most profound impact is on the IT organization, because this change is occurring as IT evolves from a hierarchical, mainframe-centric environment to an enterprise-centric one.

IT is also evolving from an independent "internal monopoly" to a service organization competing for end-user business. The objective of the newly defined IT is to partner with end users to focus on the enterprise's customers; its overall responsibility is to transform technological complexity into strategic business advantage and facilitate change.

To manage this transition requires a mind-set and cultural change from three constituencies: end-user departments, IT and senior management. Each group must be educated about its new role. End users are typically the most amenable to change, IT the most resistant, because as the most entrenched, it stands to lose the most power. The most sensitive challenge is senior management, which now must involve itself more in IT direction.

IT should focus on six areas:

1. Marketing IT services and value. As IT becomes more service-oriented, it must proactively market its services to end users, assessing its effectiveness via ongoing user feedback.

2. Integrating IT into the business units. The goal is to create an IT/end-user team focusing on better servicing customers. Programs to improve interpersonal skills will be augmented by hiring non-traditional IT personnel with strong communications skills, who will be charged with identifying opportunities and ensuring user satisfaction.

3. Creating, managing and sustaining an environment of change. Effecting change in today's IT organization underlies every major IT initiative. Complications arising from managing change across increasingly broader geographical boundaries, maintaining service levels, and coordinating enterprisewide IT changes (when business units are in different growth stages) are key challenges. IT must handle those who resist change, in part by creating programs that reward behavioral changes.

4. Reorganizing IT to the new organization paradigm. Users' increased power necessitates an IT governing body comprised of heads of business units. This group is responsible for enterprisewide IT strategy, endorsing policies, guidelines and standards, and evaluating the risk/reward of IT initiatives. Once this organization is functioning, enterprises evolve to an "insourcing" paradigm, where IT competes for departmental business with outside vendors and service providers.

5. Managing enterprise expectations of IT through ongoing education. One of IT's responsibilities is educating its customers/end users so they have realistic expectations of IT, can assist in exploiting new technologies, and can better resist the misinformation promulgated by self-serving vendors and overly simplistic media articles.

6. Re-engineering IT's human resource management. To make the transition to the new enterprise, IT will need to attract and motivate a new breed of IT professional: technically astute (in Unix/open systems computing, client/server architectures and networking); able to manage projects in cross-functional environments; adept in communicating with customers, employees, and senior management; and able to apply changing technology rapidly to business needs.

Bottom Line

Effective IT management in the 1990s requires recognizing the new order and IT's changing role — its scope is now the enterprise; its focus is bringing value to the business and architecting change. The objective is IT/business integration, with IT measured on its role in improving business processes, customer service, and, ultimately, profits. •

Marc Butlein is chairman and co-founder of META Group and executive director of the *META Executive Council*.

Mr. Butlein is an authority on IBM, the large systems marketplace, and the IT challenges facing large users. He has over 29 years of experience in the industry and has lectured extensively in the U.S., Canada, and Europe. Prior to co-founding META Group in January 1989, Mr. Butlein spent 19 years with IBM, where he held various marketing, development, and corporate positions, and six years in the market analysis and assessment industry.

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Facing radical changes in the agribusiness environment due to deregulation and globalization, United Grain Growers decided to update its multi-site grain elevator computing system in 1992 to improve customer service, efficiency and timeliness of information.

After obtaining proposals from several vendors, United Grain selected Hewlett-Packard's HP 9000 Unix-based business servers as the foundation for its new system.

In 1993, during the period in which the grain elevator system migration was underway, United Grain began a restructuring that was necessary for it to become a publicly traded corporation. In response to demands from management for easier access to financial information and more reporting flexibility, the company also decided to move from its mainframe-based computing system to a client/server environment. Impressed with HP's technologies and pleased with its level of support on the elevator computing project, United Grain selected HP for this second project as well.

The new systems have positioned the company to respond to continuing industry changes, and streamlined internal operations.

The first project involved the replacement of aging equipment from Digital Equipment Corp. that had been put in place in multiple sites.

Project 1 DEC Replacement Project at Multiple Grain Elevator Sites

Multi-user HP 9000 systems streamline grain-handling process. In the early 1980s, United Grain installed a DEC PDP 11 minicomputer in each grain elevator to print receipts, sales slips, checks and storage tickets; maintain inventory records; and track grain shipments.

Each PDP 11 minicomputer communicated via modem with the head office mainframe (an IBM ES9000/9121) several times a day, uploading business transactions and downloading commodity prices as well as shipping instructions.

United Grain wanted to move to a multiuser system with a database that elevator managers could browse for farm products, prices and delivery dates. Also required in the multiuser system were online communications capabilities that could speed the flow of information between headquarters and the elevators. But the PDP 11 minicomputers presented an obstacle to these enhancements because they could not be updated to provide the required functionality.

In January 1992, Guy Wood, United Grain's managing director of MIS, invited three vendors — DEC, IBM and HP — to learn about his company's business and to propose a solution to meet its changing needs.

United Grain Chooses Complete Business Solution

According to Wood, "HP was the only vendor to present a total business solution, including third-party software, financing, systems integration and training. They not only met our technical and price requirements, and supported our future direction, but they also proposed taking full responsibility for the project, including conversion. They committed to our schedule and were confident about their ability to implement their solution, which raised our comfort level."

Because United Grain wanted to get the new grain elevator system up and running over a winter season during the industry's slow period, timing of the conversion was critical. HP was selected in August 1992 and successfully completed the project on schedule by February 1994. As part of the transition, consultants from HP's Professional Services Organization (PSO) converted half a million lines of macro assembler code to the new platform.

Productivity Raised, Support Costs Lowered

Although United Grain is just starting to use the new grain elevator platform, it has already reaped benefits. Because the platform enables users to perform a range of functions simultaneously, productivity at the elevator sites has doubled, pleasing elevator managers and customers. "Our customers used

Most companies give you one type of database. Which is great if you only have one type of user.

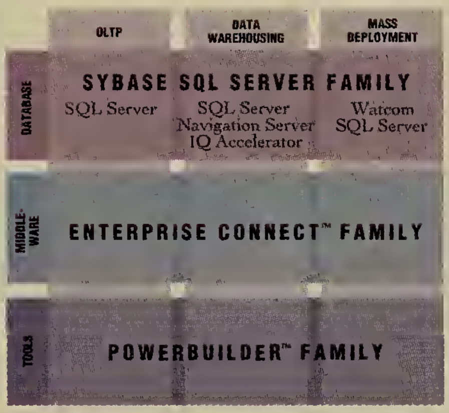
Today's users come in all shapes and sizes. Funny how most vendors' databases don't.

Instead, they simply offer a one-size-fits-all solution. Which, in reality, fits very few.

Specialized options for specialized needs. Sybase takes a different approach. Our architecture gives you optimized database options—as well as industry-leading middleware and de-facto standard development tools—each built for a specific need and purpose.

On-Line Transaction Processing. Old information is useless information. Which is why you need the price/performance of SYBASE® SQL Server.™ Achieving extremely high transaction rates, it's been proven in the toughest real-world, real-time applications.

The Sybase Architecture: Optimized Products for Specialized Needs



	OLTP	DATA WAREHOUSING	MASS DEPLOYMENT
DATABASE	SYBASE SQL SERVER FAMILY SQL Server	SQL Server Navigation Server IQ Accelerator	Watcom SQL Server
MIDDLE-WARE	ENTERPRISE CONNECT™ FAMILY		
TOOLS	POWERBUILDER™ FAMILY		

The database that's right for your data warehouse is probably too large to deploy widely. Which is why Sybase offers optimized solutions—as well as industry-leading middleware and de-facto standard development tools—to meet your specific needs.

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Mass deployment. You can't deploy a big, bulky database to places like your sales force and retail outlets. Which is why you need Watcom™ SQL. It's designed to let your database go where it's never gone before.

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to wait an average of 20 minutes for grain receipts," Wood said. "They've been pleasantly surprised to receive their documentation in seconds."

And with fewer hardware problems, United Grain's support costs have dropped dramatically. The company has been able to reassign two of the four developers formerly responsible for system maintenance.

The new platform also allows instantaneous, transparent communications between headquarters and the elevators. In the past, each time headquarters transmitted the latest commodity prices to the elevators, the system shut down for 20 minutes. Now the satellite systems can transmit prices without interrupting operations.

With the new platform in place, United Grain is redesigning other related systems. "By the time we're finished, we'll have a completely new system with data accessible throughout our entire network and online communications that permit immediate information exchange," said Wood.

Project 2
Mainframe Alternative for Corporate Computing

In 1993, as a publicly traded corporation with responsibilities to stockholders, United Grain faced increasing pressure to operate more cost-effectively. This required up-to-date information and better ways of measuring performance. Rather than renegotiate the lease on its IBM ES9000 mainframe, United Grain decided to move ahead with a project that had long been considered: to migrate its mainframe-based corporate computing systems, including finance, marketing, inventory management and sales processing, to a cluster of Unix servers.

United Grain replaced its mainframe with six midrange HP 9000 business servers — including one for backup. Over 350 people in 15 locations now access the servers through Windows-based PCs over a frame-relay network. Since United Grain had been gradually replacing its terminals over time, most users already had personal computers.

Migrating To The New Environment

One critical goal of the migration was to move to a financial system that would offer better access to financial information and greater reporting flexibility. As a mainframe customer, United Grain had developed a strong relationship with Dun & Bradstreet Software, and therefore became one of the first customers of the company's new SmartStream client/server financial solution.

The project also required porting the company's remaining mainframe applications, which included Software AG's Adabas DBMS and applications written in Natural, RPG, PL/1, and macro assembler languages, to the new Unix environment. United Grain ported the Software AG applications directly and, with HP's Professional Services Organization assisting, rewrote the remaining applications in Natural.

For network administration, United Grain uses HP OpenView Network Node Manager, which optimizes monitoring and control and reduces downtime and network and system underuse. For job scheduling, the company uses Unison Maestro workload management software.

"The biggest challenge we faced in migrating from the mainframe was the timeframe," said Terry Light, manager of systems development for United Grain. "We started the conversion in February 1994, with the objective of completing the migration before the mainframe lease expired at year-end. We beat the deadline by a full month."

Over a 12-month period, 16 mission-critical applications were converted, including 10,000 Natural objects such as programs, sub-programs and maps. "We couldn't have met our deadline without HP's PSO," stated Light. "With the size and scope of this migration and our lack of client/server knowledge, we needed their assistance in managing the project, training our staff, and running interference on problems and questions."

"Defining a new architecture for decision support involves more than development tools. It also means understanding a company's business processes and objectives."

Guy Wood, managing director of MIS, United Grain Growers

New System Meets Requirements, Cuts Costs

Although United Grain's main goal was to improve functionality rather than reduce costs, Wood estimates that the new system is saving the company about $1 million a year — roughly 20% of its annual information systems cost. This estimate is based on a projection of expenditures to service the increasing demands of users if the mainframe had been retained, including costs for

Continued on page 22

rightsizing… off-loading… client/server architectures… open systems…. At a time of unprecedented technological change, do you really have time to train your information technology partners? Software AG has 25 years of experience with production quality systems in mission critical environments. Hewlett-Packard is the world sales leader in UNIX systems. We're already up to speed — and we're working together. So why trust your future to beginners? Instead, call us at **800-843-9534, extension 2000.**

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SOFTWARE AG

Defining A New Architecture for Decision Support

Flexibility Vital to Achieve Competitive Advantage

Today's fast-paced, global business marketplace demands that companies react quickly to changing market conditions.

However, IT organizations that depend on proprietary architectures to provide them with realtime information about their business are often hard-pressed to meet those criteria. Not only does vital data frequently seem to be "locked up" on mainframe and proprietary midrange architectures, but delays in processing also often render information meaningless when it finally does arrive.

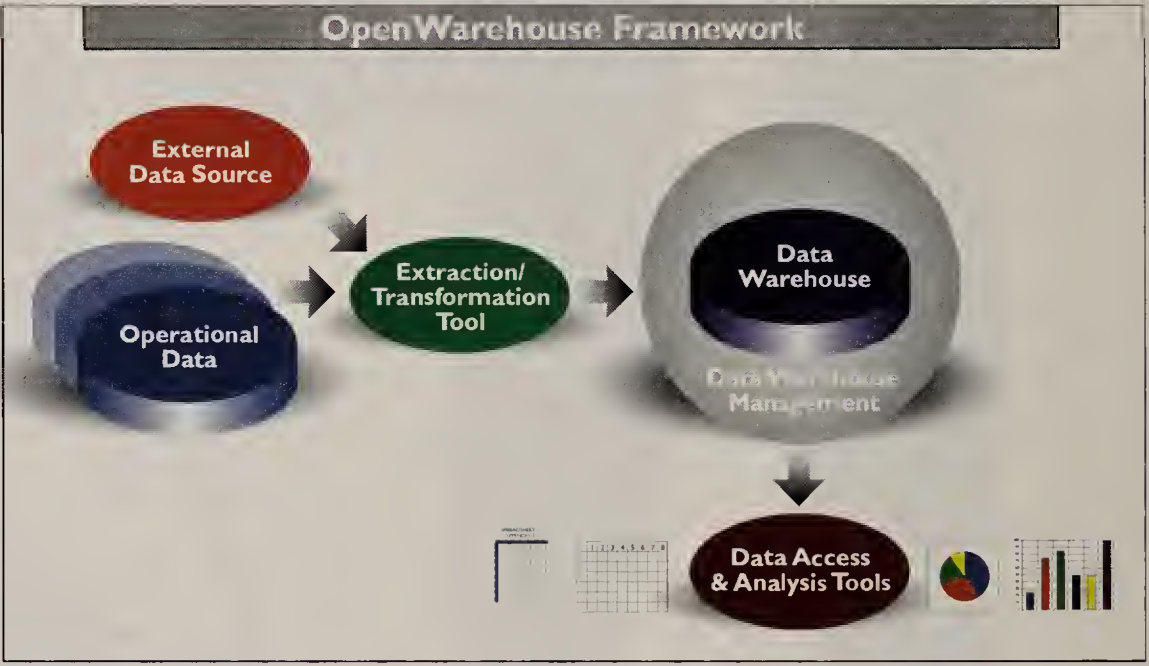
Implementing decision support and data warehousing solutions on open systems platforms which surround, or coexist with, the mainframe can provide the flexibility required in today's business environment. Companies have improved the timeliness of information retrieval, been better able to support new lines of business, and made more informed decisions about distribution, pricing and new product development. Implementing decision support applications on open systems platforms brings new functionality to end users. It also gives MIS the opportunity to work with open systems without getting involved in the complex process of moving mission-critical, transaction processing applications off the mainframe.

Data Warehousing

In the past couple of years, the concept of data warehousing has found broad industry acceptance as a solution for decision support. A data warehouse is a specialized decision support database, taken from a variety of operational sources and then "scrubbed" to eliminate any inconsistencies or errors.

Because the data warehouse is a separate database, access to it does not impact operational systems. Knowledge workers receive immediate value from the data warehouse through using a variety of access and analysis tools to create general purpose reports, to perform ad hoc queries and to drill down into more detailed layers of data.

Hewlett-Packard has been a pioneer in creating cost-effective, efficient solutions for data warehousing. HP has experience in creating a centralized, enterprisewide data warehouse for its own executives, marketing and sales personnel, and has worked with more than 100 data warehousing projects in a cross-section of industries.


OpenWarehouse Framework
External Data Source
Operational Data
Extraction/ Transformation Tool
Data Warehouse
Data Warehouse Management
Data Access & Analysis Tools

HP OpenWarehouse provides the framework for delivering complete data warehousing solutions through a range of hardware and software products and consulting methodologies.

Based on that experience, HP has developed practices and methodologies, as well as a set of tools to enable organizations to make better use of data warehousing in an efficient implementation process.

HP OpenWarehouse Framework. At the core of HP's decision support implementations is the program known as HP OpenWarehouse. HP OpenWarehouse provides the framework for the company's ability to deliver complete data warehousing solutions through a range of hardware and software products and consulting methodologies. The components of HP's OpenWarehouse are designed to rapidly translate user requirements into fully functioning data warehouses that help companies achieve their business objectives.

HP OpenWarehouse solutions can handle databases of a few gigabytes on a single processor server to databases of multiple terabytes on clustered server environments. HP's framework is unique in that it allows customers to plug in the specific RDBMS and data warehouse tools that best fit their specific business requirements.

In addition, HP has strong technical and marketing relationships with the major providers of data warehouse components, including suppliers of extraction/transformation tools, database management environments, and data access and analysis tools.

HP Intelligent Warehouse. To address customer concerns about data warehouse manageability and usability, HP has developed the HP Intelligent Warehouse data warehouse management software. Intelligent Warehouse consists of open middleware together with administrative tools to help administrators manage, tune and handle security in data warehouse environments.

Intelligent Warehouse also provides greater ease of use for end users through centrally managed business views that can be used by most ODBC-compliant data access tools and many OLAP (on-line analytical processing) tools. In enterprise configurations, Intelligent Warehouse can play an even larger role as a unifying backbone for enterprise decision support systems with both data and metadata integration.

Consulting Services. Defining a new architecture for decision support involves more than making use of development and management tools. It also requires the understanding of a company's business processes and objectives. HP's consulting services are designed with that in mind, ranging from simple technology and expertise transfer to full systems integration with HP assuming prime responsibility.

For a company partnering with HP, the path to a successful implementation typically consists of a scoping engagement followed by rollouts of the phases of a data warehouse project. The scoping engagement analyzes business objectives, user requirements, the operational environment and the target architecture requirements and delivers architecture recommendations. The subsequent rollout phases demonstrate the business value of the warehouse, integrate it into the organization's existing systems, and finally expand its role into an enterprisewide resource.

> **"To build medium- to large-scale data warehouses, IT must engage the services of a competent integrator. With both a capable consulting staff and innovative data warehousing software, HP should be on IT's short list for data warehouse implementations."**
>
> *December 30, 1994 Application Development Strategies report, Meta Group*

Successful Pilot Earns Worldwide Rollout

Successful decision support architectures reap immediate benefits. In one case, a global consumer packaged goods company had spent a year trying to implement a proprietary decision support system on an IBM 3090 before giving up on the mainframe as too slow and too expensive.

HP implemented a solution based on an open, client/server architecture with HP 9000 servers and standard Microsoft Windows clients. Data was extracted on a regular basis from the operational databases on an IBM mainframe and integrated with point-of-sale and retail-inventory data in an Oracle RDBMS on the HP 9000 server. A sec-

IT Drivers for Decision Support on Open Systems

▷ **IT Drivers**

- Use less costly computing resources
- Provide flexible environments which accommodate changing market conditions
- Preserve stability of current mission critical systems
- Release data from the glass house "jail"

▷ **Technology Trends**

- Rightsize to mainframe alternative platforms
- Migrate to open systems taking advantage of new client-server applications
- Migrate decision support applications to open systems and thus "test the waters"
- Develop data warehouses; growing market of sophisticated, easy-to-use decision support tools for end users

ond server further summarized the data for analysis purposes.

The results of the implementation showed a dramatic 30% to 40% decrease in the time that the company's employees spent searching for information. Reports that previously took two weeks or more to produce manually became available on-line in less than a minute.

> Defining a new architecture for decision support involves more than making use of development and management tools. It also requires the understanding of a company's business processes and objectives.

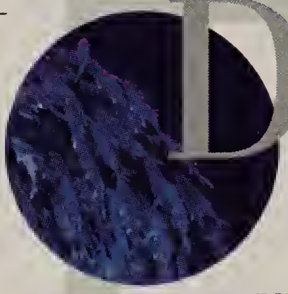
Based on the success of the original pilot, the company has deployed full-scale data warehouses in two countries and plans to expand its implementation to encompass additional business units worldwide.

Summary

Implementing a decision support application on open systems can provide the flexibility needed in today's business environment. Defining a new architecture for decision support involves more than an understanding of the databases and tools that best serve the needs of a company. It also involves a thorough understanding of a company's business processes and the ability to provide flexible solutions.

Through its success in rearchitecting its own decision support system, its OpenWarehouse solutions framework, and its partnerships with data warehouse component suppliers, HP is prepared to offer cost-effective, efficient decision support solutions that will grow with a company's needs.

Dun & Bradstreet Information Services Builds Data Warehouse with SAS System



Dun & Bradstreet Information Services (DBIS) is the world's leading supplier of risk management, credit and marketing information, and decision support services for business customers. In the past five years, DBIS has significantly changed its marketing strategy and subsequently delivered a number of new products and services including portfolio-risk-analysis and database-marketing services. During this same period, DBIS was asked to reduce IS costs by offloading their processing from the mainframe.

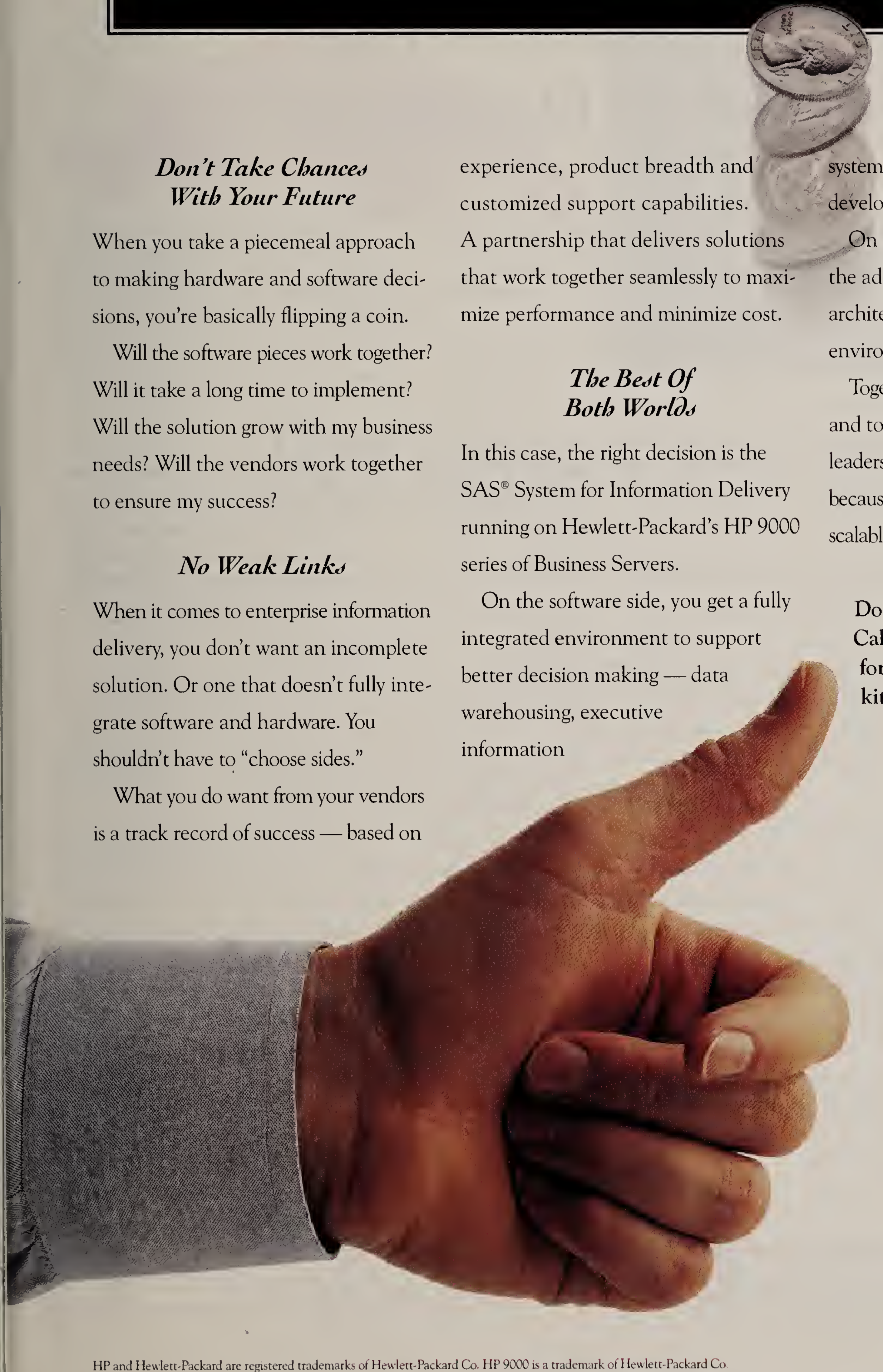
Before the downsizing, many requests for information about customers' accounts took at least one day to process, including several hours of programming time. SAS Institute utilities running on the mainframe were used to bring together data from various files, manipulate the data and derive new information tables. Not only was this process highly time-consuming, but the staff also experienced problems in obtaining processing time on the mainframe.

The solution that DBIS implemented was to build a data warehouse on an HP 9000 Unix-based platform using the SAS System tools they were familiar with, and to dedicate the system to processing customer information requests. With SAS on the HP server, the total time to download data from the mainframe, and to build and index the warehouse is 11 hours. The programming staff uses SAS System modules to interface with the data warehouse. Fulfilling customer requests is now a one-step process, typically taking several hours, instead of several days. With a dedicated processor, obtaining computer resources is no longer a problem. The data warehouse project took approximately one year from evaluation to creation, plus another six months of testing and tuning.

Not only did the HP/SAS System data warehouse solution speed things up, it has proven to be flexible as well. "The data warehouse continues to grow — it is not a static entity," said Karen Grippo, senior application consultant for DBIS. "It is constantly changing as we load more and more data down to the HP system."

The HP/SAS solution has had a positive effect on DBIS' bottom line. "The major benefit has been to decrease the turnaround time so we can provide much quicker response to customers," said Grippo. "These new services generated significant new revenue in their initial release. HP and SAS continue to allow us to grow in the future."

Added Grippo: "Specifically in the area of client/server computing, HP and SAS allow us to move the power closer to the customer — and that is our goal."



Decisions Are a Lot Easier When You Don't Have To Choose Sides.

Don't Take Chances With Your Future

When you take a piecemeal approach to making hardware and software decisions, you're basically flipping a coin.

Will the software pieces work together? Will it take a long time to implement? Will the solution grow with my business needs? Will the vendors work together to ensure my success?

No Weak Links

When it comes to enterprise information delivery, you don't want an incomplete solution. Or one that doesn't fully integrate software and hardware. You shouldn't have to "choose sides."

What you do want from your vendors is a track record of success — based on experience, product breadth and customized support capabilities. A partnership that delivers solutions that work together seamlessly to maximize performance and minimize cost.

The Best Of Both Worlds

In this case, the right decision is the SAS® System for Information Delivery running on Hewlett-Packard's HP 9000 series of Business Servers.

On the software side, you get a fully integrated environment to support better decision making — data warehousing, executive information systems, object-oriented rapid application development and data visualization.

On the hardware side, you get all the advantages of powerful RISC architecture in a fully open client/server environment.

Together, you get complete integration and total support from two established leaders in information technology. And because the entire offering is modular and scalable, it can even save you money.

Don't take chances, take action! Call 1-800-HP-ASK-ME ext. SAS1 for a free decision support action kit today!

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GE Appliances Builds a Flexible IT Environment

GE Appliances, a $6 billion division of GE Corp., manufactures a wide variety of major home appliances, and employs some 23,000 people.

GE Appliances has a reputation within GE for being very experienced and knowledgeable about client/server architectures, even hosting "best practices" sessions to share its growing expertise. All this knowledge has been earned in a relatively short period of time as GE Appliances transformed itself from an organization heavily dependent on Bull and IBM-compatible mainframes and proprietary mid-range systems to an organization leveraging the power of client/server in a multi-platform environment.

Transition to Client/Server

Before the transition to client/server, the data needed for decision support was not readily accessible, was sometimes unreliable, and was expensive to gather and display using mainframe resources. Then a decision was made to move off the mainframe, and the IT organization began to look at reengineering its decision support systems as a first step in its mainframe offload.

Now, little more than two years later, the company has moved full-force into client/server. More than 50 HP 9000 systems run more than a terabyte of operational and decision support data, primarily with a leading RDBMS in a Unix environment. At the heart of this transformation is GE Appliances' emphasis on defining a new architecture for decision support.

"Originally we only thought offloading the mainframes to a client/server architecture would offer cost savings, but along the way we discovered that client/server was also the solution to many of the limitations we faced in our decision support systems," said Stephen G. Crone, process leader for information warehousing.

Implementing a Data Warehouse

GE Appliances based its new decision support architecture on the concept of data warehousing, where operational data from multiple sources is extracted, reorganized and cleaned up, then loaded into a new database around informational subjects. Unlike the operational systems, the data warehouse is optimized for decision support queries, rather than transaction processing. To date, GE Appliances has implemented three data warehouses — in Sales, Service Management and Quality — with a total database of over 250Gb.

Sales Management. In the Sales operation, data is pulled from eight different operational systems and used to build a large relational database on an HP 9000 T500 6-processor system with a Microsoft Visual Basic front-end application.

The warehouse provides analysis of sales and profit-margin data, allowing salespeople to analyze pricing and promotion data on an account-by-account basis. The information now available includes sales data on individual customers, actual sales vs. plan numbers, and the sales trends in particular markets or regions.

> **"Originally we only thought offloading the mainframes to a client/server architecture would offer cost savings, but along the way we discovered that client/server was also the solution to many of the limitations we faced in our decision support systems."**
>
> *Stephen G. Crone*
> *Process Leader for Information Warehousing*

"Using the data warehouse, we get a complete analysis at the customer level, which gives us a truer picture, as opposed to bits and pieces of information," Crone said.

One unexpected benefit of the warehouse has come from the process of validating and cleaning up the operational data.

By applying the same set of rules to data in reports coming out of the operational systems to those from the warehouse, inconsistencies can be traced back to the operational side and corrected. This has led to improved data integrity at the operational level.

Service Management and Quality. GE

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Relax and enjoy the performance.

TEXAS INSTRUMENTS

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Appliances has also implemented the data warehousing concept in its Service Management operation, which manages warranty and service contracts for all appliances sold.

Since Service Management is an independent profit and loss center, decision support data in this area is as important as in product sales. The Service Management warehouse is housed on an HP 9000 T500 6-processor system and has over 100GB of disk. Desktop data access and reporting is done with standard third-party query and reporting tools.

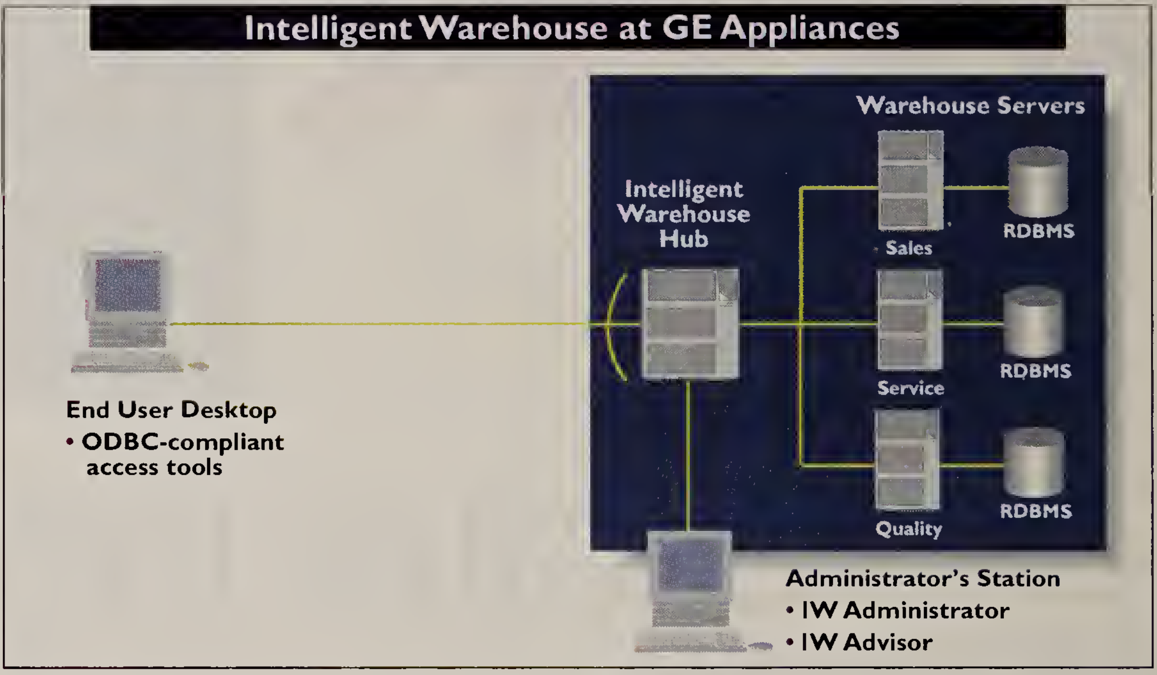
A third solution is GE Appliances' Quality data warehouse, which is used to perform root cause analysis on appliance quality issues. The warehouse will eventually be used by several hundred employees and is based on an HP 9000 high-end server.

Intelligent Warehouse

As GE Appliances developed its data warehousing architecture, it foresaw the need for a unifying set of middleware that would tie together its multiple warehouses and provide a complete information view to its end users. The company evaluated HP's Intelligent Warehouse software and selected it to provide this single information-resource capability together with greater ease of use and improved warehousing performance.

> "Our main goal for this activity is that, as our organization begins to use these warehouses, we will have more and more instances where people will want to identify linkages between the information in different warehouses."
>
> *Stephen G. Crone*
> *Process Leader for Information Warehousing*

Intelligent Warehouse provides end users with a business view of the warehouse and shields users from having to see the more complex physical columns, tables and databases of the data warehouses. GE Appliances has also seen significant performance benefits from Intelligent Warehouse. Although results have varied, reporting time in one instance has been reduced from between 18 and 24 hours to less than two minutes.



Intelligent Warehouse provides end users with a business view of the warehouse and shields users from having to see the more complex physical columns, tables and databases of the data warehouses.

Intelligent Warehouse also provides the data descriptions, or metadata, that form the basis for GE Appliances' Encyclopedia — an end-user information catalog that allows users to easily determine both what data elements are available in the warehouses and what are the business definitions for that data.

Intelligent Warehouse is now implemented for the Service Management warehouse, and integration with the Sales and Quality warehouses will take place over the next few months.

Next Level

Looking ahead, GE Appliances expects to take its data warehousing activity to the next level using HP Intelligent Warehouse to correlate data between the functionally separate warehouses, creating what would be, in essence, a single logical warehouse. An example would be comparing service contracts against production line problems to find the root causes of product defects and to suggest changes or improvements.

"Our main goal for this activity is that, as our organization continues to use these warehouses, we will have more and more instances where people will want to identify linkages between the information in different warehouses," said Crone.

"We want to give the user the ability to correlate data between physically separate warehouses, transparently — as though the decision support system for GE Appliances were a single information source.

"That," he added, "will really provide important long-term benefits." •

Transitioning the IT Skill Set

Making the transition to an open, client/server environment presents challenges ranging from modifying your computing architecture, to changing your business practices, to realigning your organizational structures.

Often the greatest barriers are resistance to change and a shortage of the necessary IT skills. Overcoming these barriers is vital to a smooth, cost-effective transition.

IT managers must develop strategies for dealing with this transition period. During this period, an organization is transformed from one with a set of well-developed, yet increasingly outdated skills, into an organization with a set of newly-acquired skills, ready to redefine its future.

One strategy is to work with an experienced transition consulting team to create a transition solution which arms your internal IT staff with the skills needed for success. This process includes assessing the impact of the proposed solution on the organization, performing a training needs analysis, and finally developing an education approach.

Another strategy to manage the transitional period is to blend the skills of your internal IT staff with the focused expertise of a vendor well-versed in client/server through "selective outsourcing." At the same time, a coordinated, comprehensive education program ensures that an organization's internal resources, from executives to front-line professionals, all develop the attitudes and skills to support the new technology.

Transitional Education

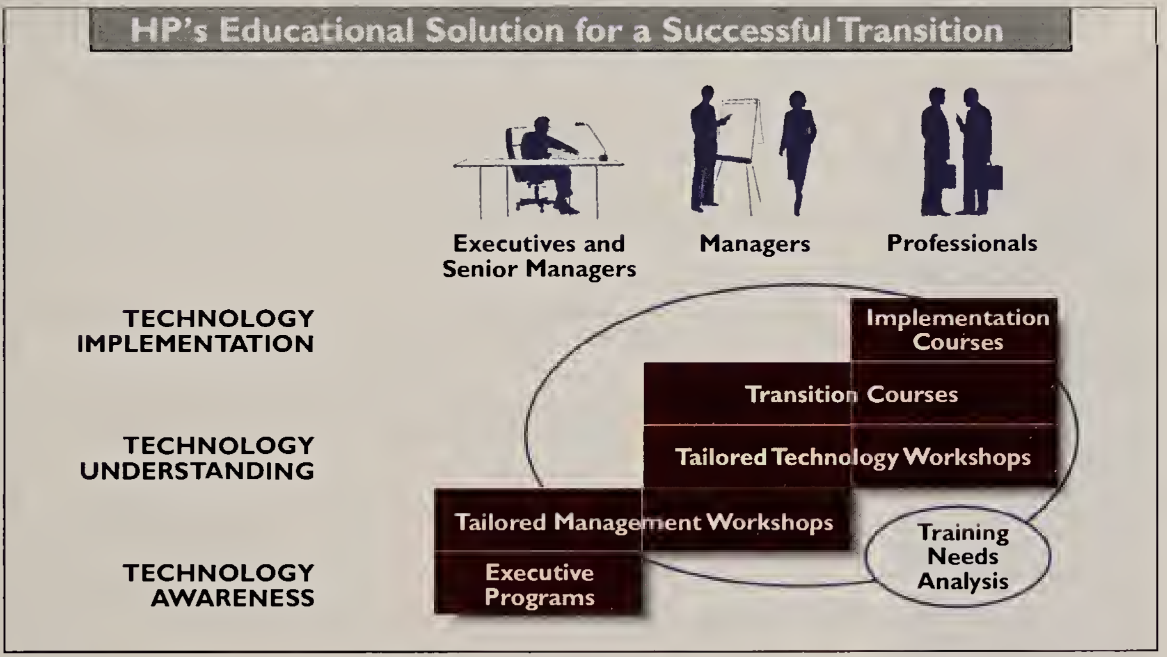
Goal of Training. If client/server enables IT systems to support business change, then education and training enable individuals to support change in IT systems. In the future, most organizations will survive or fail on the basis of the collective skills and capacity of their workers. Nowhere is this more relevant than in our IT organizations.

Transitional education involves more than just taking employees through the basics of open systems technology or client/server architecture. It also involves developing the right attitude and skills to support the new technology.

Effective training reduces resistance to change by removing doubts about the new technology. It builds confidence among your staff, so they can make a valuable contribution in the new computing environment. Investing in training demonstrates your commitment to success. With the right training, your organization will support the transition to an open systems, client/server environment with enthusiasm, motivation and effective actions.

Benefits of Education. Effective education not only provides your staff with a shared vision of how open systems and client/server will strengthen your organization, it also will build enthusiasm for new technology directions, will enable faster development of the skills needed for the transition, and will ultimately result in a smoother and more successful deployment.

Methodology and Approach. HP recognizes that education and training during a transition are essential to its success,


HP's Educational Solution for a Successful Transition
Executives and Senior Managers
Managers
Professionals
TECHNOLOGY IMPLEMENTATION
TECHNOLOGY UNDERSTANDING
TECHNOLOGY AWARENESS
Implementation Courses
Transition Courses
Tailored Technology Workshops
Tailored Management Workshops
Executive Programs
Training Needs Analysis

Effective training not only provides a shared vision of how open systems and client/server will strengthen an organization, it also allows faster development of the skills needed for the transition.

and accordingly has developed a coordinated and comprehensive program to build awareness of the new environment, generate understanding, and develop technical implementation skills.

For example, HP's transitional education includes instruction on how to perform traditional data center functions in a client/server environment and explains the similarities and differences between mainframe and Unix systems.

Drawing upon more than 100 existing client/server seminars, workshops and courses, and offerings by our training partners, HP creates an individualized program that delivers the right training mix for your business needs. To identify skills gaps, HP education consultants begin with a thorough training needs analysis. An important early step involves preparing both business managers and IT staff for change by building a common awareness and understanding of open systems and client/server and their impact on business strategy and goals. The objective is to align business and IT. This step creates support for the technology vision, facilitates organizational change, increases effective follow-up after implementation, and raises your employees' learning levels.

Success with Transition Education Services. Forest products giant Weyerhaeuser is one company that has recognized the importance of education to the successful transition of its corporate-wide IT infrastructure. Weyerhaeuser is in the midst of a 7- to 10-year migration to open systems from a huge and diverse mainframe-based computing environment.

Working with HP, the company has outlined a four-step retraining plan to help more than 900 IT professionals throughout the U.S. and Canada to understand what open systems are, the expected benefits and the employees' respective roles in the transition.

The curriculum also gives them technical skills and knowledge so they can plan, implement and support open systems themselves. Realigning information technology resources with business objectives will also enable Weyerhaeuser to create the differentiated services and products that are crucial to its achieving world class leadership.

> **Working with Hewlett-Packard, Weyerhaeuser has outlined a retraining plan to help more than 900 IT professionals throughout the U.S. and Canada to understand what open systems are, the expected benefits and the employees' respective roles in the transition.**

Systems Management Services	Provide monitoring, backup, administration, and other operational activities for centralized as well as distributed systems from HP and other open systems vendors
Network Management Services	Provide monitoring, fault isolation, problem resolution, and performance reporting for wide and local area networks
Help Desk Services	Provide end users with direct access to HP's support engineers for desktop application assistance, trouble-shooting, and problem management
Business Recovery Services	Provide planning, orchestrated rehearsals, and access to backup computing to minimize the impact of disasters on your information technology resources
Consulting and Systems Integration Services	Provide services for the planning, design, implementation, and project management of open, client/server IT solutions
Financial Services	Provide flexible solutions for acquiring and disposing of a broad range of technology assets to meet cash flow requirements
Implementation Services	Provide engineering, installation, and configuration expertise to implement desktop and networked environments
Maintenance Services	Provide fault isolation and repair of multivendor desktop and networked environments
Educational Services	Provide custom education and over 200 courses including a broad portfolio of open, client/server training

Through HP's selective outsourcing, customers can choose part of one or any combination of the nine services listed and described above.

Outsourcing For Client/Server

Selective Outsourcing. Outsourcing refers to buying IT services from a vendor that your internal IT staff might have performed otherwise. Many organizations have been hesitant to outsource because it meant relinquishing control to an outside vendor, possibly becoming locked into a long-term contract with hidden costs, and having no way to ensure quality performance.

To address these concerns Hewlett-Packard has pioneered the concept of "selective outsourcing," a short-term, scalable, low-risk relationship in which IT management selects exactly which IT activities will be outsourced. Selective outsourcing provides maximum flexibility and allows companies to complement internal resources with external expertise while maintaining control of IT responsibilities and strategies.

Outsourcing During the Transition.

Vancouver Stock Exchange

The Vancouver Stock Exchange needed a new generation trade clearing system to run in 50 sites across Canada.
Their choice: Dynasty & Hewlett Packard

Ericsson

Ericsson needed an enterprise client/server application for managing cellular networks in 17 countries around the world.
Their choice: Dynasty & Hewlett Packard

THE CHOICE: DYNASTY & HEWLETT PACKARD

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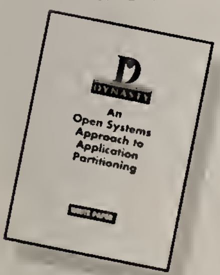

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Alain Grambert,
HP Program Manager, Europe

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During a major transition, such as the move to open systems client/server, selective outsourcing supplements the internal skill set with specific technical expertise, tools and processes that will better manage the transition process.

In some cases, the vendor supplying outsourcing services can be used as an interim solution until internal resources are hired and trained. In other cases you may not want to invest internal resources in skills that will only be used for a transitional period, or for activities that are not considered strategic to new technology architectures.

Benefits of Selective Outsourcing. Outsourcing allows a company to focus its internal staff on core competencies, or strategic business and IT issues, and to avoid permanent staffing costs in more transitional areas.

Selective outsourcing also improves performance by providing needed technical skills and products, including access to technical experts, industry leading systems management and network management technologies, and methods proven in other organizations in similar industries. Selective outsourcing also helps contain costs by avoiding expenses normally associated with bringing IT organizations "up the learning curve." Each of these benefits is best summarized thusly: Selective outsourcing improves an organization's effectiveness and ability to adapt to change.

> Selective outsourcing improves performance by providing needed technical skills and products, including access to technical experts, industry leading systems management and network management technologies, and methods proven in other organizations in similar industries."

Success with Outsourcing. Keramag AG, a German manufacturing company, decided to reengineer its IT infrastructure to support strategic business initiatives in customer service and delivery. Keramag implemented a new client/server-based application environment, upgraded hardware, developed a powerful PC LAN, and integrated the warehouses and production facilities through a WAN.

Keramag outsourced the software development to the application vendor and the IT management to HP. This outsourcing solution ensures that Keramag's information and its IT infrastructure are accessible even if part of the network or system goes down.

FoxMeyer Health Corp. is expanding its business to provide information-based healthcare services throughout its entire supply chain. The company decided to seek help in creating and managing the new client/server based environment because client/server technologies were new to its mainframe-focused IT staff.

FoxMeyer selected HP as its technology integrator not only for the transition but also for the ongoing management of the client/server environment, including performance of its frame relay network.

Through selective outsourcing, FoxMeyer was able to achieve high levels of technical skills immediately after the new system was implemented. •

UNITED GRAIN GROWERS SHARPENS COMPETITIVENESS WITH CLIENT/SERVER

Continued from page 10

hardware upgrades and software.

The entire corporate system is also more flexible and responsive to user requests, which is critical in a deregulated environment where information needs change constantly. "This flexibility allows our department to be more of a coach to users," Wood said. "Instead of designing systems for them, we can give them the flexible applications they need to create their own reports and adapt them as the business changes."

Platform For The Future

Although United Grain is already benefitting from its new systems, it has just begun to exploit these tools. "Moving to Unix has allowed us to build a platform for the future," said Wood.

"We now have a cluster of servers that can run batch, online and client/server applications, allowing our developers to design applications that meet user needs without having to design around technical constraints," he added. "With the speed and flexibility this new infrastructure provides, we're positioned to respond as deregulation and globalization continue to impact our industry." •

Master the Risk, Reap the Rewards

Huron® ObjectStar™ from Antares Alliance Group minimizes the risk of migrating to client/server

How can global information technology (IT) organizations implement client/server applications while retaining valuable legacy assets? Antares Alliance Group, an international channel partner in Hewlett-Packard's Mainframe Alternatives Program, minimizes the risk of transitioning applications from the mainframe to open computing environments with its Huron ObjectStar software.

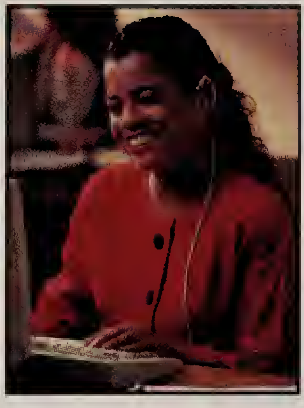
ObjectStar helps companies take full advantage of the benefits of distributed computing. ObjectStar enables creation and implementation of client/server applications that seamlessly integrate new applications and legacy systems. Even decades-old applications can be selectively renewed and redeployed at a pace that meets business needs. This means organizations can maximize current IT investments — hardware, software, and staff — without starting from scratch.

When Isuzu Motors America wanted to input user-requested changes in real-time, and to actively involve users in new systems development, ObjectStar delivered. Now that Isuzu is building applications with ObjectStar, according to Gary Gray, Isuzu's Vice President of Business Management and MIS, "The number of requests to enhance our latest system after it moved into production is almost zero."

ObjectStar is easy to use. With only a few weeks of training, developers can deliver multi-platform, client/server applications. ObjectStar supports distributed computing from the mainframe to the desktop.

End users are involved throughout the development process, enabling the development team to produce high-quality applications that are aligned with strategic business goals.

So make the most of your legacy computing investment...improve developer productivity...integrate old and new systems. Do it all in record time with the only enterprise client/server integration system that seamlessly blends legacy assets with new technologies.



For Omaha-based MATRIXX Marketing, ObjectStar delivered impressive two to five times gains in productivity with online applications. "Huron ObjectStar delivered speed, flexibility, and the ability to make application changes easily," said Ed Steele, Systems Administrator, MATRIXX Marketing.

Find out how ObjectStar can safeguard your client/server migration. Call Antares Alliance Group at 800/416-2888 (ext. 175) and 44 1252 344 400 outside North America, or Hewlett-Packard at 800/HP-KNOWS.

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the customer. However, self-promotion should be the final focus of a marketing plan, not the first. The challenge is to change the culture of the systems department so that it sells not the technology or its systems skills in general but its role in harnessing the technology to business needs. Option number one fails to do this. It is a journey to guaranteed obsolescence.

2. Customer-Driven Alignment. This might be called Just-Do-It marketing. It is based upon the premise that the customer is always right. IS staffers embracing this approach realize that they are the experts in information systems, but that they (in most cases) do not work for a computer company. Their customers are the experts in the application of IS to meet the firm's needs. Effective communication, especially listening, is the ultimate critical success factor. A simple "Ask, Listen, Clarify, Do, Get Feedback" model is the key.

The biggest selling point for this approach is that it is designed to meet customer-specified needs. It deals with problems that customers have today, and solving such problems rapidly can bring needed credibility to IS.

Yet for all of its intuitive appeal, this approach is unglamorous and can be much harder to accomplish than it sounds. The biggest risk is that users may not know or are unable to communicate what they want, a situation familiar to most IS professionals. To make matters worse, users are constrained by their experiences, so it is difficult to get them to talk about future needs or requirements. In addition, if there are historically poor relations between customers and IS, communication may not be open.

A typical internal hindrance to pursuing this approach is the usual lack of marketing orientation and skills among IS staff. There is also some risk that the customer's needs will require a radically different skill set than the present IS profile.

However, if the communication channels with customers can be kept open, the likely outcome for this approach is good. A record of proven delivery will also help immensely to sustain this process, to build a foundation of trust and to put interactions on more of a partnership basis.

The most popular marketing approach used by IS organizations today is to not worry about marketing at all.

3. Customer-Driven Transformation. In a perfect world, this would be the way to proceed. However, in practice this is usually Needle-in-the-Haystack marketing. The rationale goes like this: We (IS) aren't the problem; we are the solution waiting to happen. We just have to find our personal Archimedes to scream "Eureka!" for us. It certainly sounds great and appeals to every IS person's ego.

This is an attractive posture because it is business-focused, oriented toward the long term and has high potential impact. On the downside, it usually risks business disruption, demands substantial business acumen of IS, requires considerable credibility with customers, depends upon identification of customer visionaries with clout and staying power who are also willing and able to become project champions (the "needles" in our firm's "haystacks"), and probably threatens the organization.

The likely outcome is dubious. Given that messiahs only come along every few millennia, this is a long shot.

4. IT-Driven Transformation. The rationale for this marketing approach goes like this: We (IS) know the answer, which is a piece of technology; now if we could just find the problem. This is really Keys-and-Lamppost marketing in that it is reminiscent of the story about the drunk on his hands and knees under the lamppost. Although he'd lost his keys in a dark area, he explains, there was more light to look for them under the lamppost. Simply put, we (IS) are trying to find the problem that fits the fanciest technology. This phenomenon is usually found in the presence of an advanced technology group.

Option four is ego-satisfying and fun for IS. It provides a great opportunity for IS to use the latest IT and techniques and carries with it the tantalizing potential of someday becoming a hero for expanding the business strategy. Unfortunately, the risks (both business and technical) are immense. This posture requires an extreme amount of IS business acumen and credibility with the customer. In addition, the "whiz bang" nature of the technology can threaten (or bankrupt) the organization.

This is an extremely difficult sell. Like the drunk's prospects for finding his keys, the likely outcome of this approach is very poor.

The Best Bet

Of the four potential marketing strategies, option two is the obvious choice. Option one is safe but short-sighted and doesn't really address the customers' wants. At best, it explores preferences among the kinds of things IS has already decided to offer. Options three and four have demanding prerequisites: The IS group must do a superb job and have already established a track record before it can realistically expect to get anywhere with these "leading edge" approaches.

Option two, on the other hand, while not very glamorous, is the only one that is customer-centric as well as consistent with TQM, continuous improvement initiatives, IS and line management partnership, and most attempts at managing expectations for IS. Supplemented with the right kind of alliances with carefully chosen users, it can be quite forward-thinking.

In short, we must make what we can sell, instead of trying to sell what we can make. A true marketing organization puts the values and needs of its customers above its own internal needs. This is what option two is all about.

Daniel E. Klingler, PhD, is vice president of R&D Information Systems at Hoffmann-La Roche Inc., a health-care company in Nutley, N.J.

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Gartner View: Asset Appreciation

New tools and structured approaches can simplify IT asset management—even for multifarious PC resources—and generate significant savings to boot

BY MIKE VARGO

Although many enterprises track IT assets at a departmental or functional level, few have attacked the problem on an enterprisewide scale. Ask IS executives about the asset management of their companies' PCs, for example, and you are likely to be greeted with a chorus of groans. To appreciate the enormity of the potential benefits, consider that organizations with 5,000 desktops can achieve savings ranging from $1.5 million to $13 million in the first year after implementing an effective enterprisewide IT asset-management system, according to Gartner Group analysis. This missed opportunity looms larger as companies come under mounting pressure to reduce expenses. Gartner Group expects that a number of IS organizations failing to address their enterprisewide IT asset-management problems will face partial or total outsourcing by 1998.

Payoffs in the millions don't come without equally big challenges, and enterprisewide IT asset management certainly qualifies as challenging. PC assets, among the most difficult to track, have proliferated during the past three years with the explosion of desktop applications. This situation is especially hard to control because end users often buy hardware and software without informing the IS organization. And that's just the tip of the iceberg. Hardware and software costs represent only a fraction of a PC's total cost of ownership. Technical support, administration, training, user downtime, data loss from system failure and other elements account for the bulk of total cost. According to Gartner Group analysis, the total cost of ownership associated with an initial $5,000 investment for desktop system hardware and software is typically more than $41,000 over a five-year period (see Figure 1).

Fortunately, asset management can be made easier by implementing a standard set of policies and procedures, building automated asset-tracking systems and asset databases, and leveraging off-the-shelf tools.

Definition: IT Asset Management

IT asset management is a systematic approach to managing a company's hardware, software, IS departmental staff, end-user-performed IT support, technology procurement, suppliers and facilities. To be effective, it must take into consideration the total cost of ownership of all IT assets. The goal is to optimize the utilization of these assets, lower operating costs, bring about effective IT risk management, improve IT investment decisions and unlock the promise of client/server computing by making knowledge workers more productive and decisive.

Policies and Procedures

A successful enterprisewide plan incorporates the following considerations:

- A total-cost-of-ownership approach, backed by senior management, is critical for widespread and sustained success.
- A phased approach incrementally attacks areas of chaos.

FIGURE 1: Total Cost-of-Ownership Breakdown for the Major Desktop Platforms

	DOS		WINDOWS 3.1		WINDOWS 95		MACINTOSH 7.1		MACINTOSH 7.5	
Capital	$4,004	10%	$5,670	14%	$5,994	17%	$6,738	18%	$6,738	19%
Labor										
Technical Support	6,313	15%	7,045	17%	6,277	17%	6,393	17%	5,736	16%
Administration	5,919	14%	5,832	14%	4,896	14%	5,579	14%	5,537	16%
End-User Operations	25,300	61%	22,892	55%	18,692	52%	19,677	51%	17,113	49%
Five-Year Total Cost	$41,536	100%	$41,439	100%	$35,859	100%	$38,387	100%	$35,124	100%
No. of Applications	Four		Eight		Eight		Eight		Eight	

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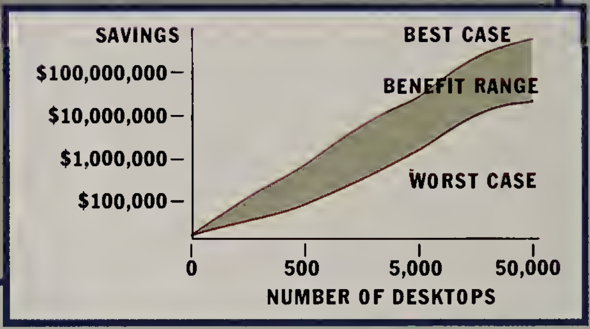
FIGURE 2: Estimated Benefit Potential From Enterprise IT Asset Management

Benefits per desktop per year	BEST CASE	WORST CASE
Savings in hardware-related items	$75	$25
Savings in software-related items	$100	$75
Increased worker productivity	$2,500	$200
Estimated benefit per desktop per year	**$2,675**	**$300**



- IS organizations must be staffed to track and maintain all IT assets.
- IS executives should understand the implications of shrinking IT life cycles and expect to make frequent shifts in technology platforms.
- Policies must include a marketing strategy to ensure that end users understand the important cost elements of desktop computing.
- Every enterprise should address the issue of illegal software, and end users should sign a statement that they have read and understand the enterprise's policy on illegal software use and other infractions.

The PC Audit: Essential First Step

PCs, LANs and other IT components must be examined and mapped into a formal reengineering plan with improved applications, upgraded system software and interconnectivity. Companies should conduct a physical inventory—often called a PC audit—to capture hardware and software inventories in an enterprisewide IT asset database. A system audit (capturing hardware and software configuration details) and a software virus check is performed for each piece of equipment, which is bar-coded for ongoing tracking purposes.

The asset database can facilitate the following benefits.

- IT budgeting and forecasting: The accounting department can reduce costs by eliminating time-consuming accounts-payable verifications, simplifying the control of tax payments and expediting reporting requirements.
- Hardware and software procurement: A view into the life-cycle costs of assets provides better negotiating leverage with suppliers and reduces redundant purchases. The software-procurement team can negotiate for upgrades and reduced licensing fees by accurately quantifying the installed base.
- Asset disposal: The IS organization will be better able to select replacement products to retire unproductive and outdated assets.
- Help-desk activities: Among other benefits, the help desk will be able to increase its efficiency by quickly uncovering nonstandard situations.
- Maintenance: If the database captures each procurement, move and disposal (ideally, through an automated system), it will also help in reconciling hardware maintenance charges and reassessing desktop maintenance strategies.

Quantifying the Benefits

The benefits an enterprise can expect to reap depend on how aggressively it adopts effective IT asset-management practices (see Figure 2). Many organizations have been able to cut their maintenance costs by more than 50 percent. Gartner Group projects annual savings in the range of $25 to $75 per desktop for hardware-related items, with ongoing savings achieved by buying services in volume.

Annual software savings fall in the range of $75 to $100 per desktop. These are achieved by reissuing redundant software licenses to future desktop projects within the enterprise, as well as from electronic software distribution and software metering.

Significant savings can also be attained by migrating users to hardware and software that will make them more productive and by providing improved application training. A typical North American knowledge worker represents an annual investment of $40,000 including fringe benefits. The potential savings in productivity improvement are estimated at a worst case of 0.5 percent to a best case of 6.25 percent.

As the size of the enterprise increases, the benefits per desktop increase at a lesser rate because of the increased complexity associated with tracking assets and the increased number of transactions needed to acquire, move and dispose of assets.

The organization's "type" also has an impact. Gartner Group defines three types. Type A is technology driven and is typically willing to risk using immature technology to gain a competitive edge. Type B adopts technology when it is proven to be beneficial. Type C is risk-averse and usually sensitive to price.

The savings will be at the high end—up to $2,500 per worker annually—for Type A enterprises that are able to reduce the pace of hiring employees because of increased productivity due to new desktop initiatives; the savings will be at the low end—$200 per worker annually—for Type C enterprises.

All enterprises practice some form of IT asset management on a departmental level. For example, accounting departments maintain records of fixed assets, network administrators keep records of network assets, and IS organizations maintain lists of software licenses. Many enterprises can profit from reengineering their asset-management practices and implementing improved procurement procedures. Benefits include reduced paperwork from the use of electronic data interchange, aggregated purchasing power and reduced accounting costs to verify and check invoices. In addition, finance groups can extract data from the IT asset-management system for various cost-saving initiatives.

Productivity gains will also come from equipping the help desk with first-class tools, including information about installed hardware and software. If workers perceive the help desk as the best source of assistance, they will not interrupt associates to solve IT problems.

IT Asset-Management Tools

Increasingly, PC hardware vendors are offering their corporate customers network-ready PCs that stress asset manageability over application functionality and raw speed. Compaq, Dell, Hewlett-Packard, IBM and other vendors are shipping systems-management tools with their newer PCs.

An enterprise can make valuable headway toward regaining control of its IT desktop assets by carefully selecting pieces of the process to automate today. In the near term, software metering, software distribution, inventory, auditing and help-desk management tools should be viewed as tactical in nature, as functions, integration and vendors will continue to change.

To decrease the risks surrounding asset-management tools, companies should conduct thorough vendor and product analyses before buying. Creating an evaluation process will become increasingly essential as more automation is introduced. Overall, Gartner Group recommends that companies plan for the future but also buy today's tactical tools.

Finally, companies must understand that asset-management tools are not panaceas. Many PC vendors are overhyping these systems' payback. This raises the danger that corporate management may believe it is not necessary to have a full staff of IS professionals, because users will be able to diagnose their own problems. However, in our opinion, the tools the vendors are shipping that help with support and administration are limited and tactical. They are not a replacement for an experienced staff of IS professionals.

Mike Vargo is vice president of equipment asset management at Gartner Group in Stamford, Conn.

EDITOR'S NOTE

With this look at the techniques and payback of IT asset management, we continue a series of Gartner Group briefings on what CIOs should know and do about technology developments. We welcome your opinions on this new column. Please contact CIO *Managing Editor Abbie Lundberg at 508 935-4731 or* lundberg@cio.com.

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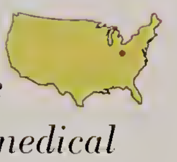

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DISTRIBUTING THE DATA WEALTH

Distributed data puts more power in the hands of decision makers. It also makes life more complicated for those in charge of making information accessible — and making sure it's accurate and secure. A panel of experts offers advice on how to manage distributed data effectively.

BY MEGAN SANTOSUS

LAST YEAR, TEXAS COMMERCE Bank stopped flirting with client/server in individual business units and committed to implementing the technology throughout the organization. "We decided to bite the bullet and reengineer the bank from bottom to top," says Anita Ward, director of reengineering. "By working on discrete lines of business, we were arbitrarily defining boundaries within the bank and missing the bigger picture." One of the results of this reengineering effort has been the need to distribute relevant data to the desktops of 9,000 employees scattered at 200 sites throughout Texas.

"We plan to have a front-end client/server system that will integrate [data from] all of the back-office systems, imaging systems, desktop applications and e-mail," explains Ward. "This will fundamentally change the nature of our business, provided we can manage distributed data effectively."

One of the benefits of distributed data will be the elimination of paper-based files. Any number of functions that previously required paper—and time—will soon be handled electronically. For example, relationship managers (the bank's new term for what were once known as lenders, trust officers and bankers) will be able to use the bank's client/server-based relationship-manager workstation to access customer information and profitability data across multiple systems. "They need to know information about the customer that may be running on the mainframe in New York, off-site at another location or on a PC within their own local area network," says Ward. The data that the relationship managers will retrieve via their desktops includes images of the customer's credit file, signature

SUBJECT

Texas Commerce Bank, Houston, a subsidiary of Chemical Banking Corp., New York

Industry: Banking financial services

Assets: $20 billion

Total employees: 9,000

IS staff: 400

Executives: Anita Ward, senior vice president and director of management consulting and reengineering; J. David Craig, senior vice president and chief technology officer

OBJECTIVES

- **Reengineer bank customer service processes with enterprisewide client/server-based applications**
- **Provide employees with desktop access to whatever information they need wherever it is located**
- **Consolidate application data repositories to a manageable number**

CONCERNS

- **What is the best way to manage distributed data?**
- **Are there any reliable database-management systems that can support mainframe workloads in a client/server environment?**

ANITA WARD: *giving employees desktop access to whatever information they need, no matter where it's located*

PHOTO BY DAN BRYANT

ERIC CHASIN
James Martin & Co.

JEFF NICKERSON
Coopers & Lybrand

JOHN ROME
Arizona State University

cards, financial spreadsheets as well as e-mail messages and other pertinent documents. "We want to be able to open new accounts from the desktop, take it on a laptop to the customer site, pull price reports and credit files at will, or anything else," says Ward.

The bank maintains multiple production-oriented Sybase, Oracle and SQL Server databases. Currently these databases serve as repositories for live, operational data that is accessed by users via a workstation inquiry screen or a pilot version of the relationship-manager workstation—and in some cases, accessed by applications themselves. Plans are in the works to develop warehouses that will contain what Chief Technology Officer J. David Craig calls analyzed or "laundered" historical data (such as aggregate demographic data) for decision-support activities. These warehouses, which Craig hopes to keep to a reasonable number, will also be accessible through the relationship-manager workstation.

- **What are the most effective ways of maintaining data accuracy, performing and tracking backups, and handling disaster recovery for distributed data?**
- **How can the IS organization best be prepared to handle client/server development and distributed data management?**

Among its distributed data management concerns, Texas Commerce Bank hopes to consolidate the operational data repositories it has created to a more manageable number. It is also looking for ways to handle data accuracy, disaster recovery and backup issues. "Data integrity, access tools and security are not as mature in client/server as they are on the mainframe," says Craig. "We are handling these issues by establishing procedures until suitable technical solutions are available." For example, bank rules regulate how data is input into the system; users must follow standard formats when entering customer account names and numbers.

Meeting transaction-speed requirements is a also challenge in managing distributed data. Although the bank's transaction speed is adequate at the LAN and desktop levels, transmittal of images, video and large packets of data across the network takes too long. Yet the cost of increasing the network's size is prohibitive.

Finally, Ward is interested in advice that goes beyond distributed data management to organizing IS to support client/server development. "What are the core competencies an IS group needs?" she asks. "Does it make sense to organize IS along functional lines of business, or by application, process or technology?"

Eric Chasin, *practice manager for core technology, James Martin & Co., Reston, Va.*

ERIC CHASIN: *"The key to data warehousing is understanding users' needs."*

PHOTO BY MANUELLO PAGANELLI

By paying attention to processes instead of functional areas of the business, you have taken the right approach to reengineering the bank. The reengineering effort creates value streams containing the people, processes and data that work on behalf of the customer and thus provide value to the business. By looking at value streams, you can prioritize what data needs to be contained in the data warehouse. However, to implement an enterprisewide solution, you need to address the existing production and legacy systems. In my experience, such systems typically contain 80 to 90 percent of the data that's required to support reengineered processes. Before you move any data into warehouses, you first need to understand where the bulk of your current data is located and analyze your data assets. Then you should attempt to consolidate the data warehouses. Limiting the number of warehouses will enable you to better manage the data in a format that most logically meets the requirements of various end users; the key here is to really understand end users' needs and how they are going to use data.

As you move from host-centric or mainframe computing to distributed

> "Limiting the number of warehouses will enable you to better manage the data in a format that most logically meets the requirements of end users."
>
> *–Eric Chasin*

computing, there must be a major investment in infrastructure that encompasses everything from networks and telecommunications to people skills and cultural change. You mention that the transaction speeds on the desktop and LANs are acceptable for many redesigned processes. The speeds may be adequate today, but no one is considering such issues as legacy system migration and the implementation of data warehouses. Both of these actions would have significant impact at the desktop and LAN level. While plans to tackle either of these things may not be imminent, I would advise you to take this into consideration now in light of your need to provide corporatewide access to data. You should consider as well that any additional applications built at a business-unit level may significantly affect the performance, stability and capacity of existing desktop and LAN systems. Keep in mind that you will be required to make a huge investment in infrastructure to achieve the kind of access you want.

As you reengineer your business, you also have to retool or reengineer the IS organization. However, teaching new technical skills is only part of the task. True, client/server development requires a broad base of skills including knowledge of local and wide area networking, advanced SQL, database design and project management. But the core competency required of the IS group is a cultural one. Most IS groups are still relatively risk-averse. It's important that IS adopt more of an entrepreneurial attitude, taking on more risk if there is the possibility of reaping a huge reward by making changes. The bank is right in recognizing that radical changes can bring significant increases in profitability to the organization. The IS group has to embrace the idea that it is a business partner and that its job is to support the goals of the business.

One of the major mistakes most IS organizations make when moving to client/server is that they don't understand that they can no longer build the monolithic, single-release systems that characterized the mainframe world. Client/server systems evolve as continual releases are built, usually within a six- to nine-month cycle. I recommend that you find project leaders within functional areas of the bank who understand the importance of delivering on time and within shorter cycles. You should also organize SWAT teams of people well versed in the very advanced technical skills required to implement client/server. By combining the functional expertise of project managers with the technical knowledge of SWAT teams, you will be in a position to leverage experience throughout your organization. As more solutions are provided and technical skills spread, you can transform the IS organization within two years.

Jeff Nickerson, *technical director, National Client/Server Practice, Coopers & Lybrand LLP, Parsippany, N.J.*

When managing distributed data, I find it important to distinguish between the operational databases that support your day-to-day business and the data warehouses that are accessed by your decision-support systems. In some cases, companies confuse the two; they realize that they need consolidated data for their applications and believe that data warehouses are the only way to accomplish this. In many cases, what they need is a hierarchy of operational databases, with interdatabase communication to handle the replication or consolidation of information that is shared among applications. Data warehouses should be kept as pure as possible—they should be fed by the operational databases but should not be accessed by everyday applications.

> "By definition, data warehouses are not operational, and therefore a long recovery from a disaster will at worst inconvenience users. The business will not be damaged."
>
> *–Jeff Nickerson*

If this distinction is preserved, then in many cases you will end up supporting a hierarchy of operational databases, along with a single data warehouse or a small set of them. In managing multiple databases, the most important issue is whether they are independent of each other or are hierarchically linked. If they are independent, they can be managed separately, and the only issue is one of economies of scale; through standardization, you can reduce backup and maintenance costs. If you are working with hierarchies of databases, then the management is more difficult. A strong interdatabase communication mechanism is needed. Sometimes replication services supplied by the data vendors will suffice. In other cases, you may want to consider store-and-forward mechanisms that will allow you to bring down and maintain one node in the tree, knowing that on restart the database will be updated.

Many companies have effectively moved mainframe systems onto relational database systems such as Sybase and Oracle. For very high-volume systems, you might consider parallel processing. The leading database vendors are just beginning

JEFF NICKERSON: *"Data warehouses should be kept as pure as possible; they shouldn't be accessed by everyday applications."*

PHOTO BY PETER VIDOR

to demonstrate the potential of distributing database operations over loosely coupled clusters of machines. So, if your transaction loads cannot yet be handled by the vendors you are currently using, you can reasonably expect high performance increases from the next major product releases.

Disaster recovery is of utmost importance with operational databases. With large databases in a complex environment, full reloads from tape will take too long. Some companies set up a hot standby on an alternate site, and use database replication mechanisms to propagate changes to this site continuously. If disaster strikes, the alternate machine assumes the production load while the broken system is fixed and restored. By definition, data warehouses are not operational, and therefore a long recovery will at worst inconvenience users. The business will not be damaged; if you think it might be, then perhaps some of the data and applications in the warehouse should be reclassified and moved to the operational systems that use the replication scheme.

Successful IS groups in the client/server arena combine old and new skills. Your business analysts will increase in value as you seek to understand existing systems and create new ones. Your current database administrators may need to learn some new skills in the performance tuning of Sybase and Oracle. Since client/server relies so heavily on communication, you may

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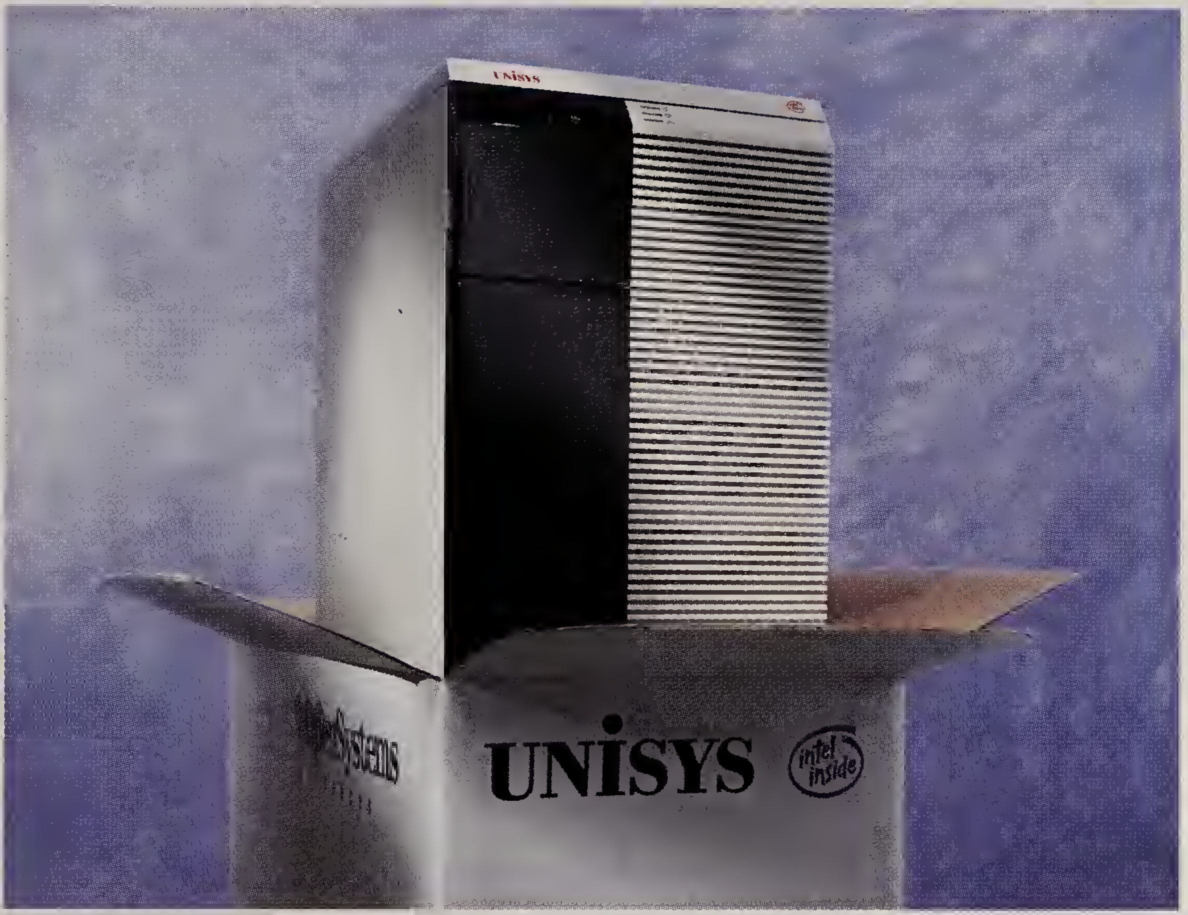

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need to bolster your network group. Those with both an understanding of networks and an ability to trouble-shoot complex situations are very valuable. Systems administrators will be tremendously important in keeping your systems up and will work with the development, network and database administration groups to solve system problems. Testing in client/server can benefit from the use of automated tools, so many companies seek tool-proficient experts in integration testing.

It often makes sense to organize application developers along functional lines of business. New code generators give developers the ability to sit alongside users, understand their business and generate prototypes; this is to be encouraged. On the other hand, it makes little sense to duplicate staff who can perform functions across business lines. So, networking staff, help-desk staff, performance testers and database administrators are most often organized along technology lines. For mission-critical projects, some companies create virtual SWAT teams of the project's key developers and technology staff. At the end of the project, the technology staff returns to the central group to service other business units.

JOHN ROME: *"The data warehouse allowed us to flirt with client/server in a trial arrangement instead of a marriage."*

PHOTO BY REED RAHN

John Rome, *Assistant Data Administrator, Arizona State University, Tempe, Ariz.*

Like Texas Commerce Bank, we at Arizona State University (ASU) are relative newcomers to client/server computing. In 1993, we adopted a standards-based approach to implementing it and started by building a data warehouse. This project combined student, financial and human resources information in a single, integrated data warehouse. Today, we support 300 end users who tap into the data warehouse with graphical user interface tools such as Brio Technology Inc.'s DataPrism and Microsoft Corp.'s Microsoft Access. Meanwhile, a student-process reen-

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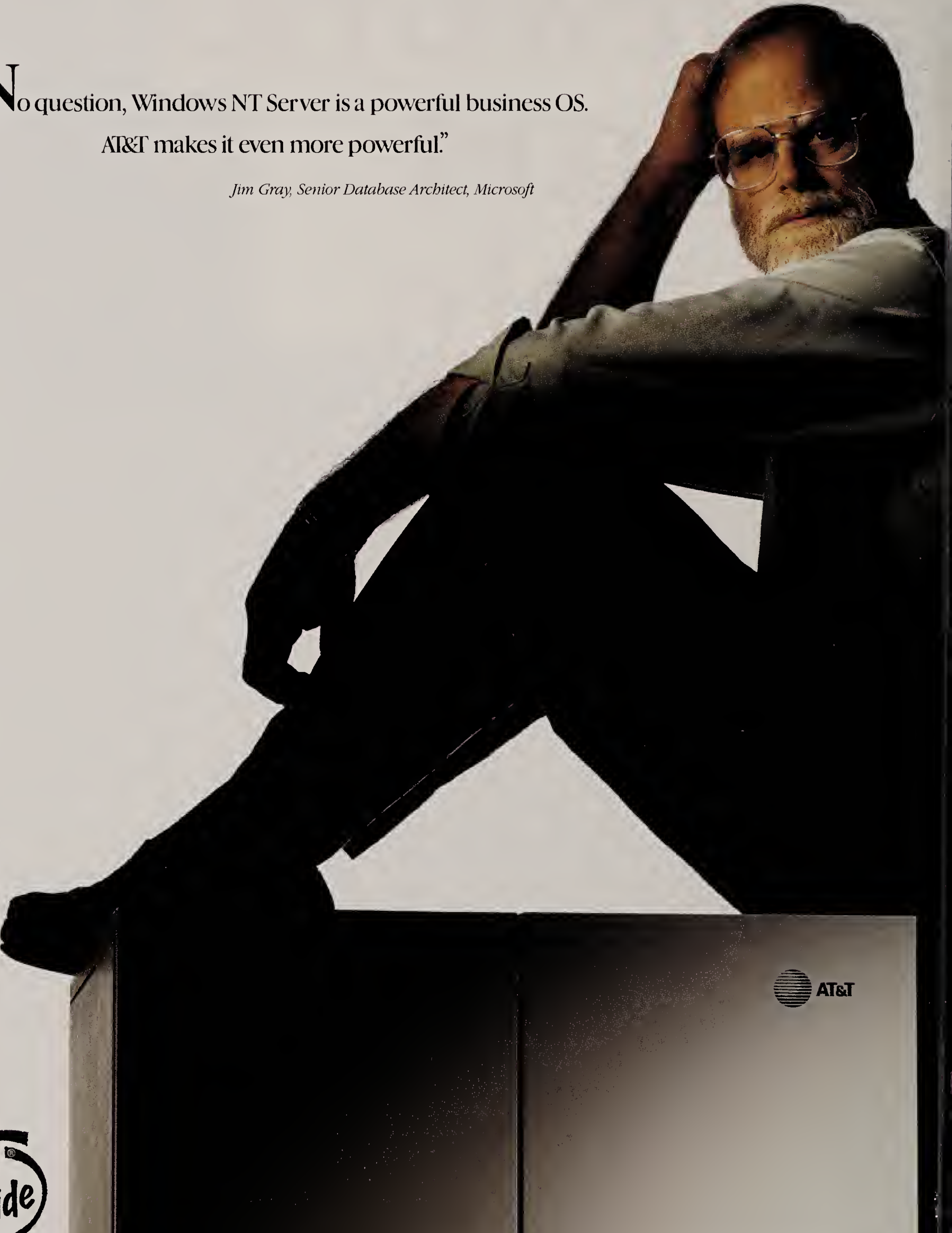

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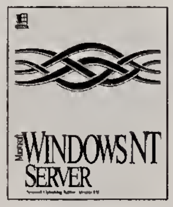

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gineering project has started, as well as many new departmental applications, all of which are client/server-based. From the beginning, our goal has been to provide applications that are easy to use, accurate and reliable. In two years, we've learned several lessons about data warehousing and managing distributed data that Texas Commerce Bank may find helpful.

Panelists' Findings

- **The key to building a data warehouse is to understand end users' needs and how they use data.**
- **Avoid cost-justification if at all possible because it's difficult to put a dollar value on decisions made with warehoused data.**
- **Don't confuse warehouses of redundant data with operational databases linked to specific applications. Keep data warehouses as pure as possible; they should be fed by operational databases and not be accessed via everyday applications.**
- **Disaster recovery is less of a critical issue for redundant data in warehouses. It's better to segregate non-redundant, irreplaceable data to the more secure operational databases.**
- **Organize application developers along functional lines of business while organizing help desk, networking, testing and database administration staff along technical lines.**

First, a data warehouse is a good application to "get your feet wet" in client/server technology. While developing our warehouse, we encountered many technical problems and shortcomings. Better to find these problems in a decision-support system than when students are trying to register for classes. The warehouse also gave some of our end users an opportunity to move from 3270 dumb terminal interfaces to a Windows environment and prepared them for client/server. Meanwhile, we found that client/server technology forces us to rethink security and privacy. No longer are we thinking about screen access, but about sets of records and multiple windows. Security also costs money. The data warehouse allowed us to flirt with client/server in a trial arrangement instead of a marriage. Don't think of a warehouse as a panacea for all your data woes. The warehouse is just one piece of an organization's client/server puzzle that enables better tactical and strategic decisions.

> "Once users can access their own data, it's only a matter of time before they offer seemingly never-ending lists of enhancements."
>
> *–John Rome*

We decided to build one data warehouse because that was the only feasible way to effectively manage our data assets. With multiple data warehouses, supported by multiple departments, there's always the risk of integration problems and different data definitions. I recommend building one centralized warehouse that offers a better opportunity to integrate the data. Integration has given us new levels of customer service. For the first time, users can get information easily from both student and financial systems. In fact, integration is a bigger concern than integrity. Although we do attempt to ensure data integrity, some "dirty" data finds its way to the warehouse, resulting in newfound data awareness. The data isn't as clean and nice as people thought, and we're taking steps to fix the processes in the operational systems to eliminate the problems.

Once a warehouse is established, it's imperative to train end users. Most GUI-based tools are fairly intuitive, so novices can pick up the basics in a few hours. We spent most of our time teaching users to understand the data. Once users can access their own data, it's only a matter of time before they offer seemingly never-ending lists of enhancements. We have a user group that meets regularly to offer suggestions and changes to the warehouse, and we have set up a process to prioritize their needs. Meanwhile, we try to manage user expectations since IS has limited resources.

Above all, try to avoid cost justification associated with building a data warehouse. I know this is difficult, if not impossible, to do. But it's hard to put a dollar value on a good decision made with data. When an ASU department was applying for a grant and needed ethnic information that wasn't readily available in the operational system, an end user was able to extract the data from our warehouse within a few minutes. We later learned that half of the $1 million grant we received was awarded as a direct result of the warehouse data. If we had tried to justify our investment in the data warehouse upfront, we never would have figured on $500,000.

In managing distributed data, it's important to realize that there are times when you won't have control. There will be distributed developers in your organization who will persist in doing things their way. If you can stress and show the benefits of playing by centralized rules, many developers out there may jump on your bandwagon.

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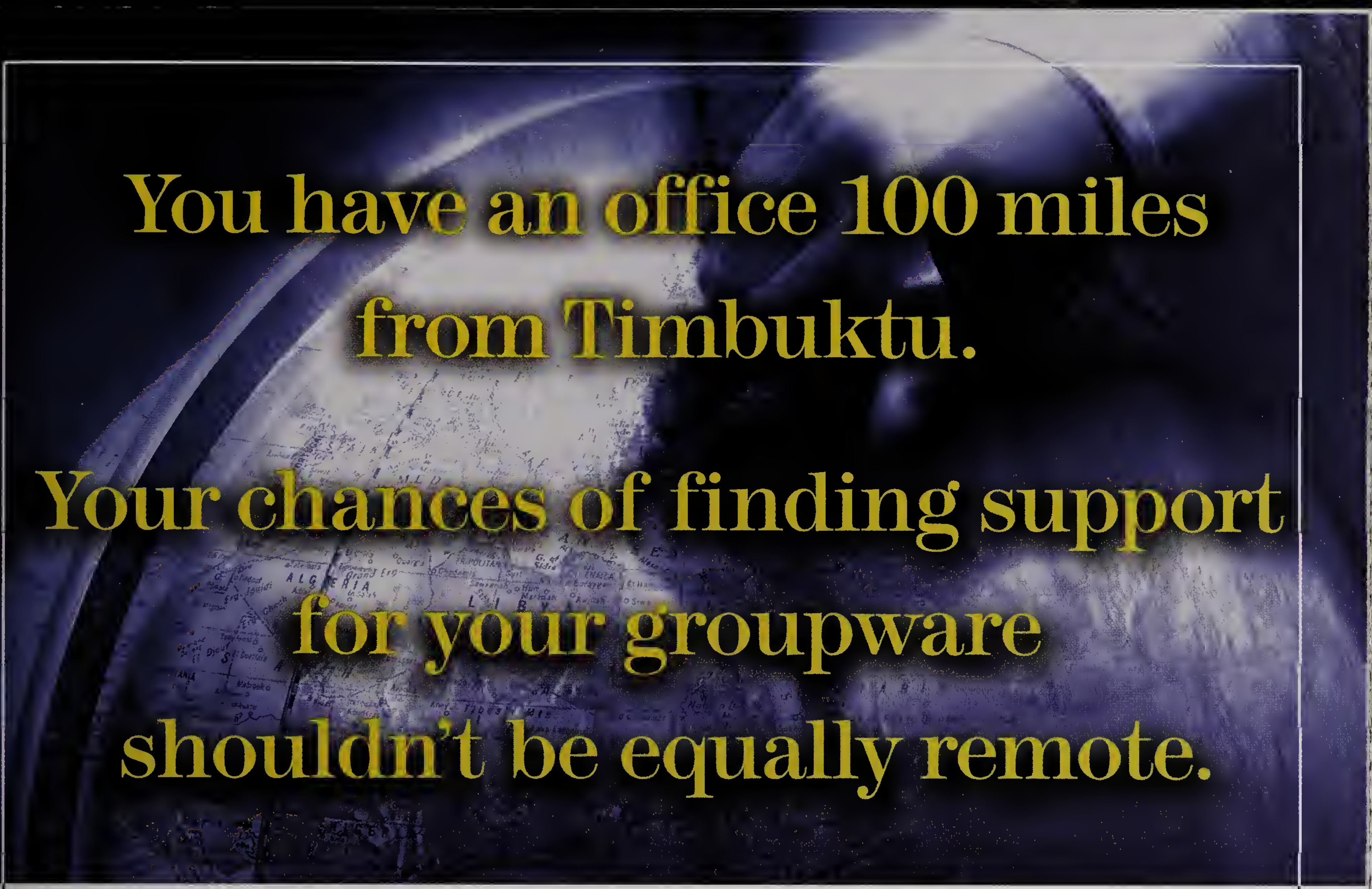
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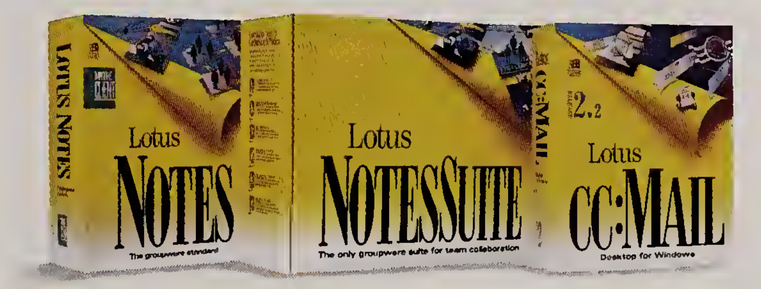

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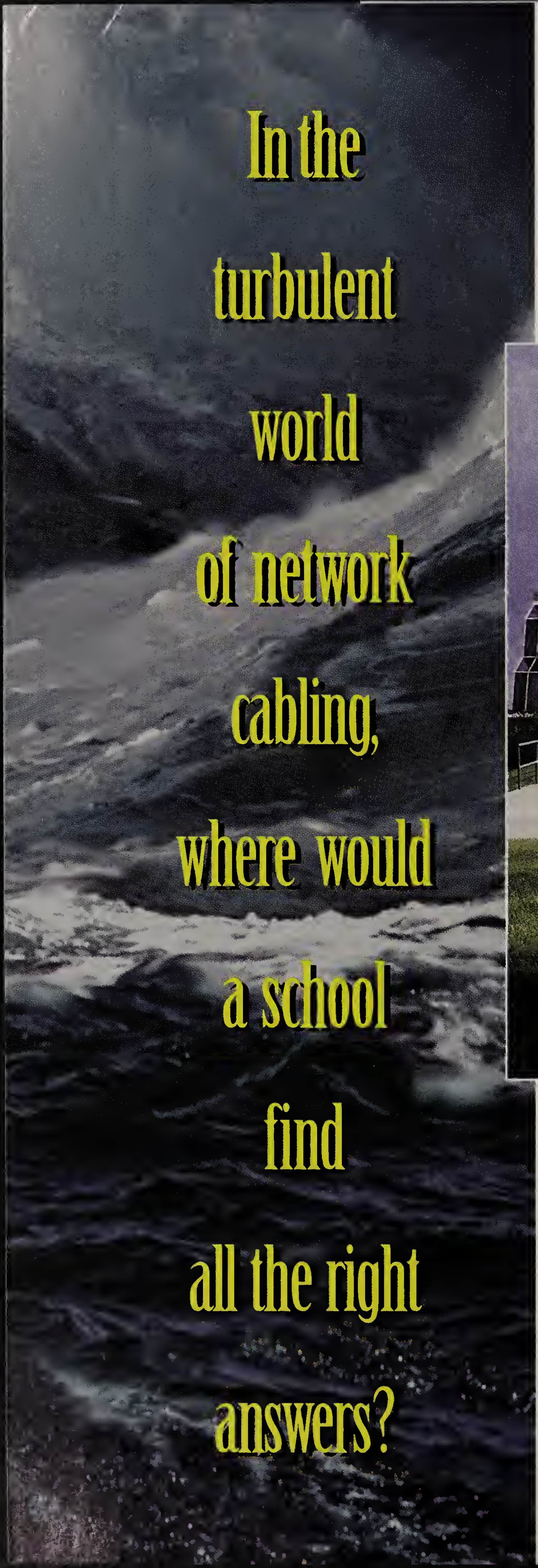

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The Cares Up There

The drone of the jet engines and occasional choppiness as the plane hit an air pocket didn't distract Ellen Knapp on the long flight from New York to Kyoto, Japan. She was too busy flipping through slides and notes for the most important speech of her career.

For the first time ever, her company's entire executive body was gathering from around the globe to hear a proposal for a single, comprehensive, worldwide technology strategy. And Knapp, vice chairman of technology at the accounting and management consulting firm Coopers & Lybrand LLP, was the someone who would be climbing the podium steps to exhort her peers.

Not everyone is cut out for the heady stuff of global technology strategy. It requires vision, the planning abilities of a general and nerves of steel.

BY E.B. BAATZ

PHOTOGRAPHY BY KENT HANSON

Knapp had always been a whiz at developing new game plans for her clients. In her former job as an IT consultant, she had mapped out and aligned information technology strategies with global business strategies for some of the world's top companies. Now, in the fall of 1993, she was on the hook not only to develop a plan but to implement it for all 126 countries in which C&L operates. "I had been wary of taking the new assignment in the first place because I knew how difficult it was going to be," she recalls.

The words of John Maynard Keynes reverberated in her brain as the plane touched down on the Kyoto runway. "The real difficulty in changing the course of any enterprise lies not in developing new ideas but in escaping from old ones," said the famous economist. Knapp knew that pitching worldwide technology standards and policies to the 126 smart, opinionated and independent C&L chairmen was going to require one bang-up speech.

Indeed, Knapp and a small group of senior global technology strategists at U.S. multinationals have been confronting a challenge that would make most IS executives wish their international flights would develop engine trouble, stop over in Tahiti and never leave. Simply put, these executives are leading the charge to develop IT strategies that marry a common technical infrastructure with a common global business strategy but that have the flexibility to meet local needs.

"The experience of successful companies suggests that [the way to meet that challenge] lies at the intersection of strategic planning and operations," says Bud Mathaisel, former director of Ernst & Young's Boston-based Center for Information Technology and Strategy and now the national director of multimedia consulting services. That means understanding the business strategy, implementing the business processes that are critical to that strategy and providing the right mix of central and local autonomy for the technologies that support those processes.

The words sound simple, but the strategizing and then the implementation are far from easy. William Gruber, president of Cambridge, Mass.-based Research and Planning Inc., points out that global companies are trying to do things that multinationals never before considered. "'Multinational' companies were firms that were trying to penetrate foreign markets but still thought of themselves as domestic," says Gruber. "'Global' firms are searching for the best place to do business without reference to geographic boundaries."

How to Be a Global Technology Strategist

Ten characteristics of successful global CIOs

1

Experience running an international division or doing global consulting

2

The ability to think strategically and be a "forward thinker"

3

Insatiable curiosity about what makes the world work

4

A refined sense of and respect for cultural differences

5

The desire to work with teams and groups of people who are not like you

6

A personality that thrives on stress

7

The ability to handle complexity, paradox, uncertainty and chaos

8

Excellent leadership, consensus-building and facilitation skills

9

A talent for cultivating business-executive sponsorship

10

A willingness to rely on the expertise of others, knowing that you don't—and can't—know everything

SOURCES: Peter Schwartz, president of Global Business Network, an Emeryville, Calif., strategic consulting company, and Atlanta-based Joel Koblentz, a managing partner of executive search firm Egon Zehnder

This new "global" strategy has had an impact on the structure of large multinationals. In the 1960s, '70s, and '80s, most multinationals operated a multitude of country-specific divisions, each with its own unique way of processing orders, buying materials and closing the books. In the '90s, global companies are attempting to manage and coordinate business around the world as one company.

Technology executives at such companies as C&L, Citicorp and Xerox Corp. have been catapulted into the inner circle of senior-executive decision makers to help pull this off. "Things have changed in the past two to three years," says Peter Schwartz, president of Global Business Network in Emeryville, Calif., a company that consults on business strategy for Fortune 100 companies. "We now recognize that technology is no longer just an outcome of the strategy process; instead [it] is one of the drivers."

When Knapp accepted her appointment to that inner circle at Coopers & Lybrand in late 1992, she realized that leading a global technology strategy was going to take more than just brains and experience. As a consultant, she had watched from the outside as other senior IS executives had struggled with the political upheavals and downright Machiavellian maneuvering that global technology strategizing seems to engender. So she knew that implementing strategy from the inside would be hard. That's why she demanded the vice chairman title before agreeing to take on the job. Being in the inner circle can be a rough and tumble experience, so every little bit of clout was going to help.

The main products of a business services company such as Coopers & Lybrand are advice and knowledge. Business processes that harness the knowledge base of the worldwide consultants are critical. The company's mission, as Knapp's Kyoto speech reiterated, is to put "particular emphasis on the ability to network multidisciplinary skills and to work together collaboratively." The business vision is to be "perceived by the market as a unified entity among the leaders of advisors to business." With this mission in mind, the matter of technology strategy became relatively easy to articulate.

"In the 1990s, we needed new organizational structures that would allow us to work in teams and collaborate. That is simply not possible with a fragmented, heterogeneous technology structure," says Knapp. "The technology we were using had been built up country by country, office by office, which was the antithesis of our new business strategy." A common computing platform (Windows-based 486 PCs) and a single electronic mail and groupware solution (Lotus Notes) rather than the hodgepodge of PCs and the four different e-mail systems already in use—would be a critical part of C&L's global technology strategy.

But in order to put a common platform in place, Knapp needed buy-in from the 126 country-specific chairmen. So in April 1993, company leaders formed the International Technology Management Group, chaired by Knapp and including six partners from Germany, the Netherlands, the United Kingdom, Canada and Australia. The group's task was to begin the process of devising strategy, proposing standards and garnering worldwide support. "We predicted that it would take at least five years to go from an autonomous to a coordinated business structure because we were aware of the barriers," says Knapp.

Those barriers run the gamut, from technical and legal snafus in integrating regional information systems to problems communicating with the troops globally to arguably the most difficult problem of trying to find the money to make the global technology strategy a reality. But despite these many obstacles, "we found that the migration [from disparate to coordinated systems] has been much faster than expected," says Knapp.

"We knew we needed more commonality in our systems so that opening a business account would be the same basic process in Istanbul as it is in Canada."

–Mary Cirillo

Knapp admits that dumb luck played a part. At the same time that the International Technology Management Group was formed, the member firms had just signed an international agreement on a new common desktop platform for the audit practice. "We moved from using rudimentary productivity tools such as Lotus 1-2-3 and word-processing software to an integrated global system" called CLASS, for Coopers & Lybrand Audit Support System, which is based on Lotus Notes. The new system was overwhelmingly accepted by C&L's clients, and the benefits of organizing around one technology—such as the ease of sharing information and the time saved when global audits were coor-

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“In the 1990s, we needed new organizational structures that would allow us to work in teams and collaborate.”

–Ellen Knapp

dinated—were quickly appreciated by audit partners.

“The good news was that this incidental success made my job easier in terms of marketing and communication,” says Knapp. “The bad news was that now I had 70,000 people clamoring for [collaborative work tools] before we had the infrastructure in place.”

Best of Breed

Across the New York boulevard from Knapp, another global technology strategist is hopping into a cab for her next overseas trip. Mary Cirillo, senior vice president for global finance operations and technology at Citicorp, logs hundreds of thousands of air miles in her job, too, and most of her plane time is spent thinking, strategizing and planning. With nearly 20 years of experience with the New York-based bank, including stints as the division executive for the global cash-management services business and the senior corporate officer in the reengineering unit, Cirillo had both the clout and the diplomacy skills that the job would require.

Citicorp’s business strategy in the corporate and institutional banking market was to leverage its 96-country presence to provide customers with a global reach and a local touch. In fact, the company’s 1994 annual report clearly states, “We will build on our banking business in North America, Europe and Japan but shift emphasis to those customers, products and capital market activities that are global rather than domestic in their fundamental orientation.”

For Citicorp’s technology strategy, this objective translated into creating a common global infrastructure with common standards, as well as consolidating and reusing the best-of-breed business processes and computer applications. “We knew we needed more commonality in our systems so that opening a business account would be the same basic process in Istanbul as it is in Canada,” says Cirillo. “Sure, we need local documentation with local languages, and local regulations will be different, but the basic process of opening an account should be the same.”

The first step was to uncover the “best of breed.” In November 1994, Cirillo pulled together a number of cross-functional teams with over 200 managers to study the entire information backbone—the networks, data centers and groupware—that the bank had been using. The project was named GF2000 Technology Roadmap. “First they did benchmarking to assess the current state” of the company’s technology infrastructure, says Cirillo. Utilizing data from Compass America Inc., the company benchmarked the data centers. The Software Engineering Institute’s Capability Maturity Model was used to benchmark the software development process. These exercises made it easier for the Roadmap teams to decide, for example, that some chunk of computer code in securities programs might have applications in the fund-management programs.

“Next, the teams brainstormed on the desired state,” says Cirillo. Aware of the dangers of planning in a vacuum, they used this opportunity to engage in discussions with operations managers, product managers and others about what, in the best of all possible worlds, the technology plans should be over the next planning cycle. “I also kept the desired-state exercises focused on just one planning cycle, not five to 10 years hence, so we could really put some skin in the game,” says Cirillo. It was at this stage in the Technology Roadmap process when IT folks teamed with business leaders and process owners and collaborated with customers and vendors to make decisions about future hardware and software standards.

The Roadmap teams are now in the process of rolling out a transition plan to get from the existing to the desired state. All along, Cirillo has kept her eye on the business strategy. “Proposed projects that are off the strategy will have a hard time getting funding, but projects on strategy are getting funded,” she says. Each business group is in the process of doing a quarter-by-quarter transition plan, with costs and goals, running through 1998. By focusing on each quarter over a short time frame, Cirillo figures she has a better chance of keeping IT projects aligned with the global business strategy.

Cirillo’s group has made some interesting discoveries along the way. For instance, they found that although the bank was very good at servicing global customers from a marketing or sales perspective, the operational structure of IS was not client-focused. When the computer program for a British-based client’s account in France hit a glitch, for example, the IS department in France might not put the English customer at the top of its priorities list. A global customer-assistance center had been in operation for 18 months, says Cirillo, but business meetings among the Roadmap participants caused the center to refocus its management strategy toward monitoring customer satisfaction assiduously, so an English customer who falls through the cracks in France gets noticed more quickly.

Letting Go

In Stamford, Conn., a short train trip from Knapp’s and Cirillo’s New York offices, a third technology strategist emerges from corporate headquarters to catch a flight to Europe. Patricia M. Wallington,

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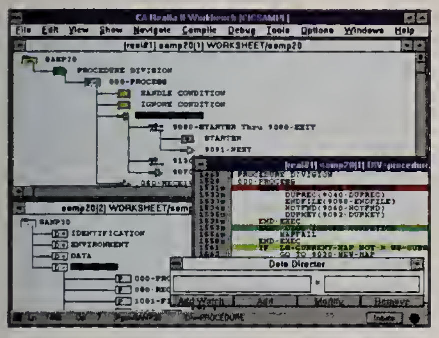

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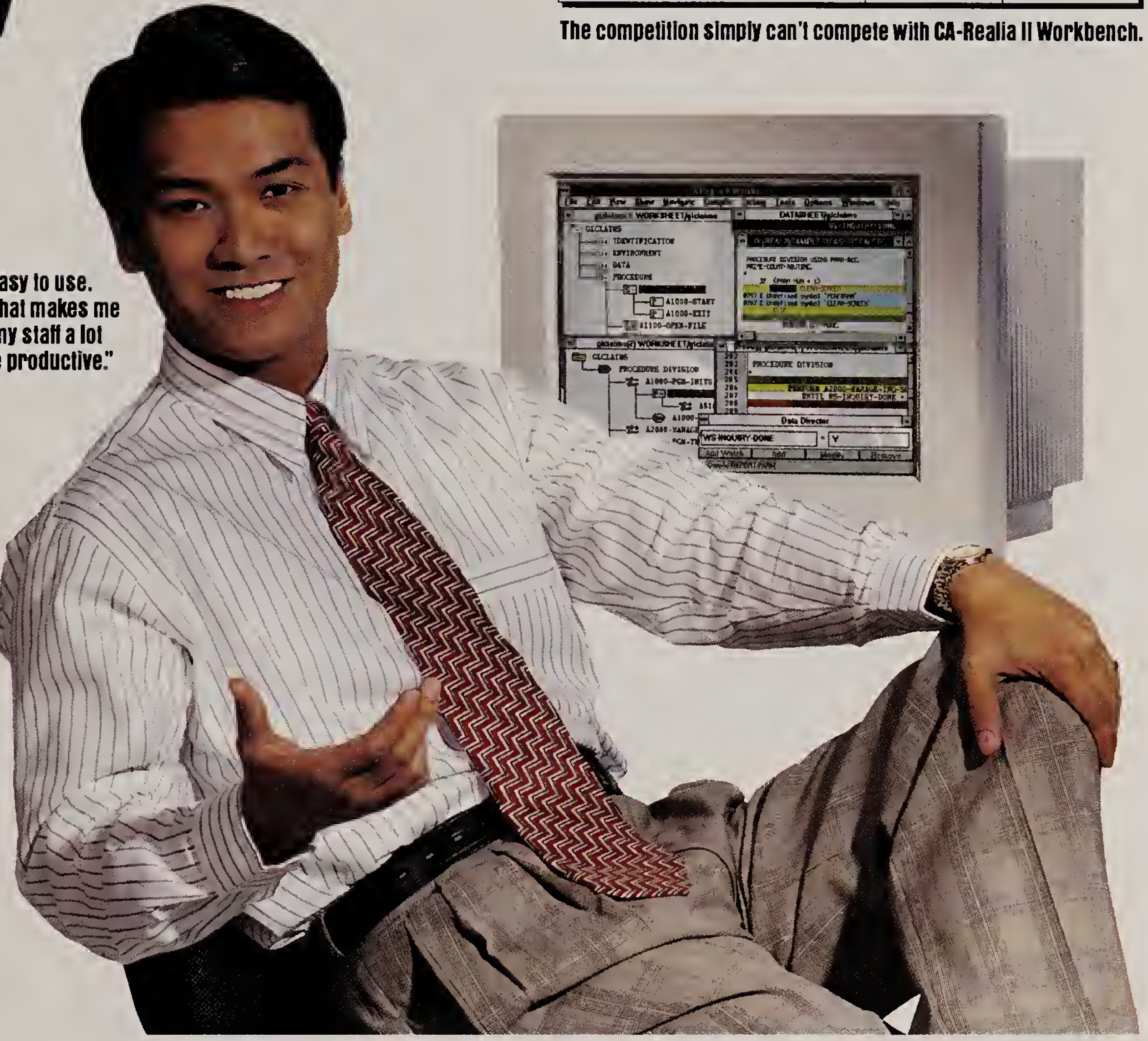

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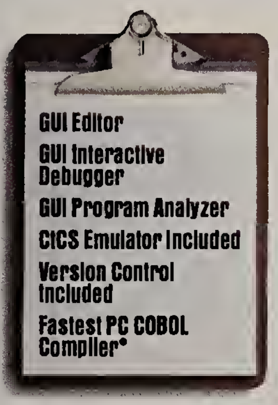

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vice president and CIO for Xerox Corp., doesn't oversee as many IT people as she did a couple of years ago, before the big outsourcing contract, but her average day is as hectic as ever. But while Wallington's travel schedule resembles those of Knapp and Cirillo, the route she has taken to integrating the company's technology strategy with its global business strategy is quite different.

Xerox operates on the front lines of the economy's transition from paper-based documents to digital publishing. Speed is a critical competitive factor for the $18 billion manufacturer of copier machines and supplier of digital publishing and printing services. Aligning the IT strategy with Xerox's global business goals has been Wallington's focus since early 1993, when the company kicked off its Xerox 2000 strategy at an international meeting in the United Kingdom. According to Paul A. Allaire, Xerox's chairman and CEO, the company's overall business strategy is "to be the leader in the global document market and one of the most productive companies in the world."

Wallington developed an Information Management 2000 strategy to parallel the corporate vision. For the IS group, the mission has been one of integration. "The difference between a global company and a multinational one is seamlessness," says Wallington. But in order to create common systems and common standards from country to country, Wallington's IM 2000 team found that the company needed to do something fast about its IS operating environment. "We were operating a legacy system that, in the division presidents' words, everyone was used to accessing on an entitlement basis," she says. "The strategic question became, 'How do we get the investment capacity to make the transformation to a new, more flexible IS environment?'"

> **"The difference between a global company and a multinational one is seamlessness."**
>
> *–Patricia Wallington*

The answer: In June 1994, Xerox awarded a 10-year $3.2 billion contract to Electronic Data Systems Corp. (EDS) to operate its worldwide computer and telecommunications networks. In the process, 1,700 Xerox employees will be transferred to EDS. "We looked at this decision in terms of the kinds of productivity gains we could achieve," Wallington says. "It enabled us to lay a new infrastructure and implement new technology solutions."

While the huge outsourcing contract stunned much of the IS world last year, the decision makes sense when viewed in terms of the company's global business strategy, Wallington says. Now she and her smaller corporate staff can work on ways to build speed into new global systems and spend more time developing global IT strategy for the future.

"The goal for global CIOs now is to see strategic opportunity at 10,000 feet and also to see how the strategy might be implemented on the ground," says Wallington.

Knapp agrees: "Strategy is the fun part. The implementation—that's hard." CIO

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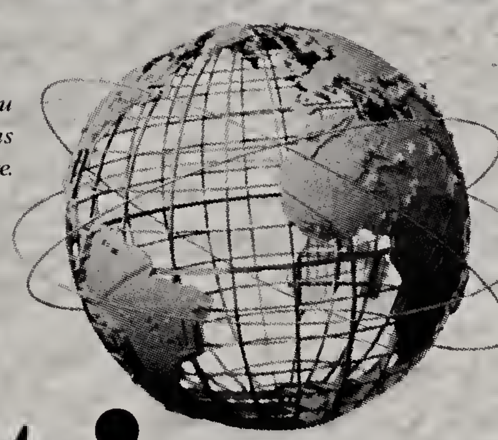

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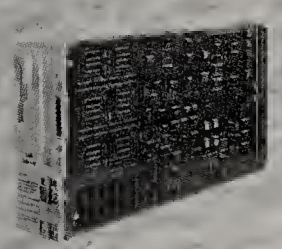

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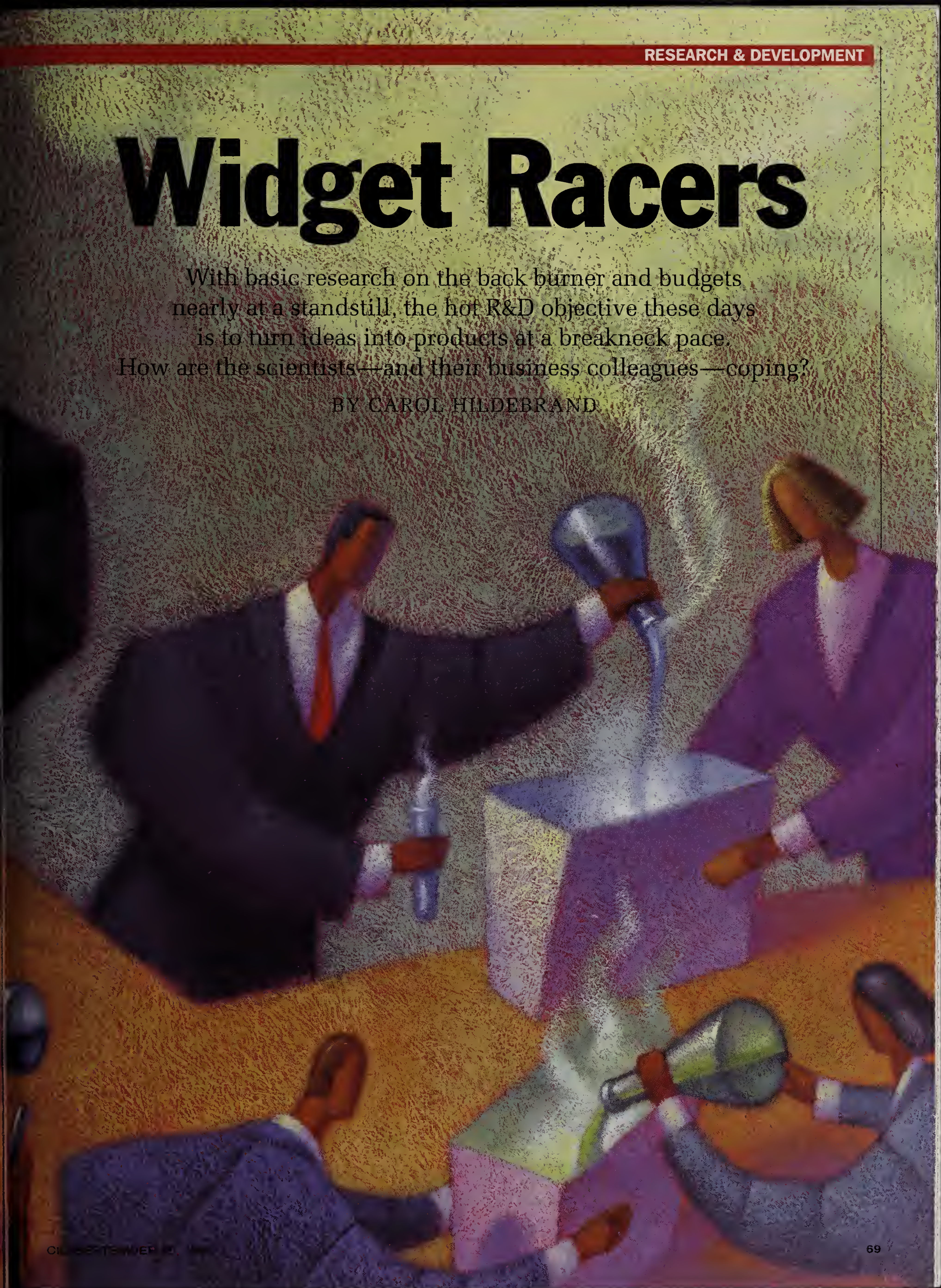
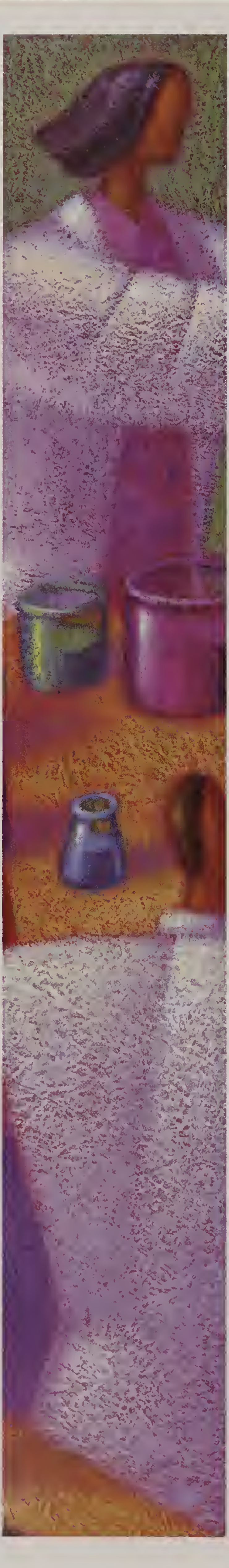
Widget Racers

With basic research on the back burner and budgets nearly at a standstill, the hot R&D objective these days is to turn ideas into products at a breakneck pace. How are the scientists—and their business colleagues—coping?

BY CAROL HILDEBRAND





AS RECENTLY AS FIVE YEARS AGO AT PHARMACEUTICAL GIANT ELI LILLY AND CO., a productive chemist would make about 90 different new chemical entities in a year, says Riaz F. Abdulla, director of scientific information systems at Lilly Research Labs, a division of the Indianapolis-based company. Today, that same chemist is expected to create 100 compounds in a matter of days. In the past several years, many companies have started asking their research and development groups to churn out new products more quickly. The drive is on to get R&D to work smarter.

For many companies, smarter translates into faster, and R&D departments are beating the clock through internal integration with line business units, external ties with specialized experts, and closer tracking of R&D projects. "There's been a lot of restructuring," says Robert Cassidy, editor of *R&D Magazine* in Des Plaines, Ill. "Increasingly, R&D people are being asked to do their jobs differently." Such integration naturally leaves many R&D groups struggling with bewilderingly rapid change, but the alternative—turning the R&D budget from a sacred cow to the fatted calf—is even more painful.

> *Just because R&D has invented something interesting doesn't mean that it accords with a company's core market strategy.*

To further complicate the picture, scientists at some companies are being asked to produce such results amidst a climate of relatively sluggish corporate funding. Although this happens not to be the case at Eli Lilly (which increased R&D spending from $839 million in fiscal '94 to $1 billion in 1995), nationally, R&D spending is generally trending flat. The Industrial Research Institute in Washington forecasts that industrial R&D funding will increase only from $103.7 billion to $107.4 billion this year—a 3.6 percent increase that is just slightly ahead of inflation.

What's more, many companies are funding less basic research of the highly theoretical kind that fosters long-horizon innovations, which in turn may eventually lead to new products; instead, they prefer to invest in applied research, which tends to commercialize products and processes already in the R&D pipeline. But if the pipeline empties of blue-sky research, the raw material of future products, where does that leave an organization in the long term? Many of them had hoped to rely on government initiatives, such as the U.S. Department of Commerce's Advanced Technology Program, to help fill the gap in basic research. But given Washington's current zeal for budget cutting, chances are high that these programs, too, will suffer.

"The amount of pure science research that's left is finding it harder and harder to get funding," says Cassidy. "For the first time, even those [pure science] guys are being forced to justify their paychecks."

But even with flat spending and a flagging commitment to basic research, high-performance companies can cut product development time without sacrificing product innovation. Indeed, new product revenues are vital to sustained growth. According to a survey by Mercer Management Consulting Inc. and *R&D Magazine,* the highest-performing companies derive a whopping 49.1 percent of sales from products developed during the last five years. It's clear that companies like Gillette Co. and 3M—which attribute 35 percent and 30 percent of sales, respectively, to products not on the market five years ago—support highly successful R&D operations. But, as in the Oldsmobile advertising slogan, this is not your father's R&D process.

ILLUSTRATION BY ROB COLVIN

COMPANIES THESE DAYS are reexamining the traditional linear product development cycle, which, although responsible for such scientific breakthroughs as the transistor, is built for comfort rather than speed. The linear method works like this:

Research and development comes up with a dandy new food additive. After tinkering with the scientific formula and creating it in limited quantities, they send it off to engineering. Engineering then comes up with a product—freeze-dried creole gumbo, say—to take advantage of said additive, but not without sending the additive back to R&D for changes, since it reacted abnormally to the limited production run that the engineers tried (the gumbo wouldn't freeze, perhaps). The new Cajun Deelite then sails off to manufacturing, and the marketing and sales functions kick in as production ramps up; of course, the stuff will need more tinkering as the gang on the plant floor finds that it now freezes too quickly when they use industrial-size machines to process it. This wreaks havoc with the proposed sales rollout.

That's tradition, but like many tradi-

Playing Well With Others

Collaboration means unifying disparate IT infrastructures

As R&D departments start working in tandem with other product development folks, it's only natural that these cross-functional teams will want to use collaborative technologies such as groupware to communicate and work together. Unfortunately, team leaders can run smack into a roadblock: Many an R&D technical infrastructure grew up in isolation from the rest of the corporate IT plumbing, and the two don't always mesh.

There was originally some justification for this now-outmoded segregation, according to Dan McNicholl, CIO at Whirlpool Corp. in Benton Harbor, Mich. The R&D function frequently required equipment from beyond the bleeding edge to do its work, whereas an accountant running Lotus 1-2-3 could get along with something a little tamer. Now, however, McNicholl points out that desktop computing power has mostly caught up with the specialized needs of the power users over in R&D. For example, CAD systems used to run on specialized computers. But at Whirlpool, the next generation of CAD will run on IBM-compatible PCs using Microsoft Corp.'s Windows NT—"the same darn computers the rest of the company [uses]," says McNicholl.

Whirlpool maintained separate corporate and R&D IS functions until this year, according to McNicholl. Now, as part of a global integration effort aimed at turning the functional silos of engineering, marketing and R&D into cross-functional design and development teams, R&D's IS group will be much more tightly linked to corporate IS. "We really can't afford the luxury of having two communities basically doing the same thing and not having to be accountable to each other," he says.

Integrating Whirlpool's IT infrastructure also involves overcoming the mutual suspicion that flourishes between many IS and R&D communities, says McNicholl. Since scientists are technically advanced enough to buy and install their own systems, they frequently do so without input from the corporate technology department; this frustrates IT employees, who have charge of companywide technology standards. When Whirlpool began its integration project, it had to address what McNicholl calls the "emotional distance" between the two groups. "The first thing that happens is that people remember all the fights they've had over the past 20 years and throw back all the reasons why we shouldn't [integrate]," he says. By installing leaders with an engineering background and encouraging a lot of "fact-based discussion," McNicholl hopes that both groups will see the corporatewide benefits of integration. One such benefit is that Whirlpool will gain economies of scale on standard software purchases and cut maintenance costs on redundant systems. Perhaps more important, science and technology employees will now be able to easily communicate and share information with the rest of the company. For example, the engineering department had its own separate e-mail system until this year, when the entire company standardized on Lotus Development Corp.'s cc:Mail. "As we looked at integrating different functions within the process, it was clear that these guys have to talk to each other. So, it made less and less sense to take one particular function and say, 'This is going to be managed differently from the rest,'" says McNicholl.

–C. Hildebrand

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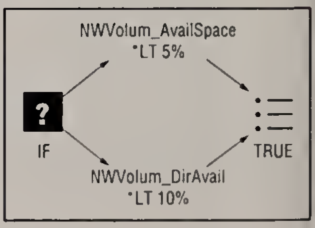

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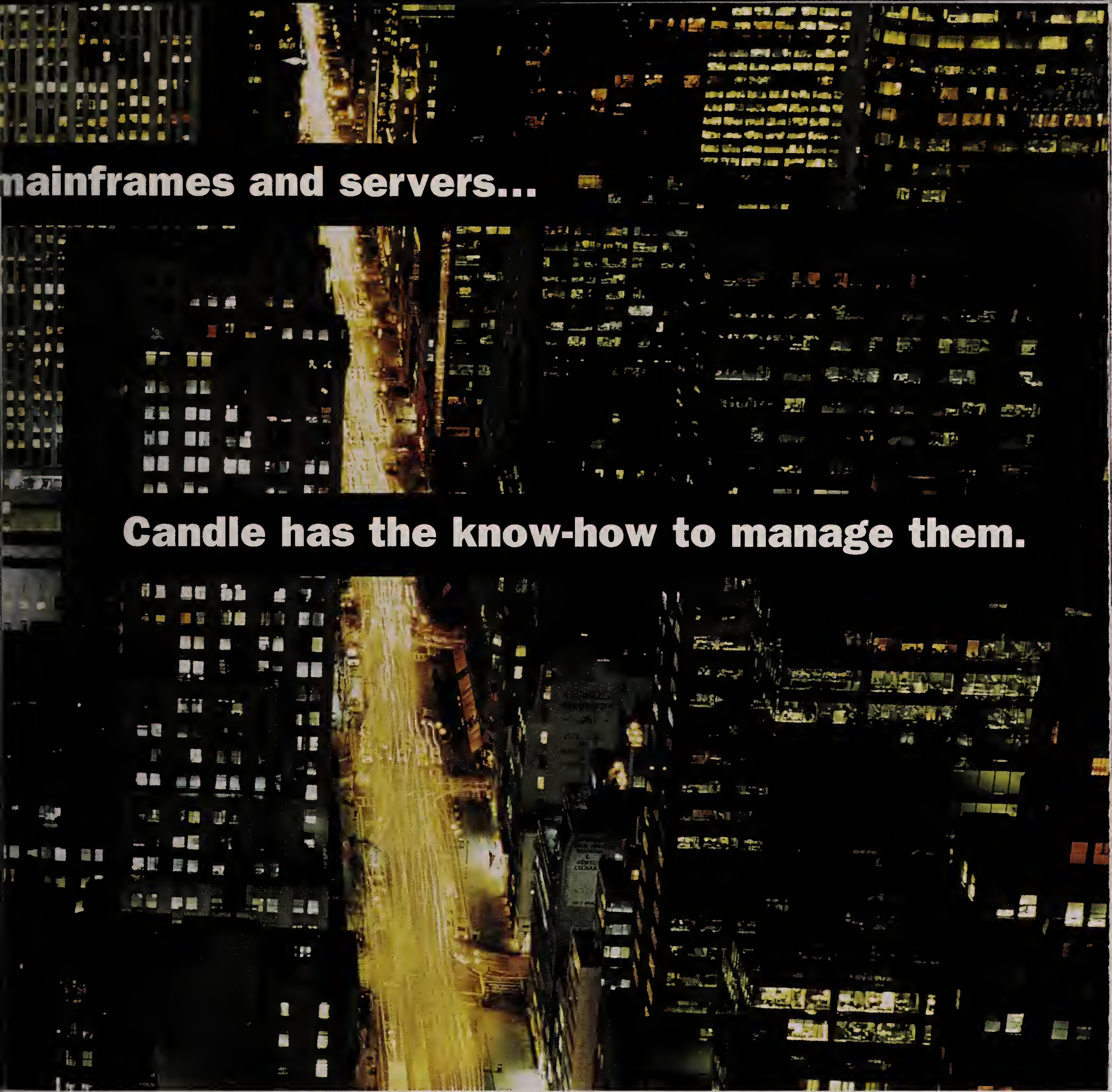

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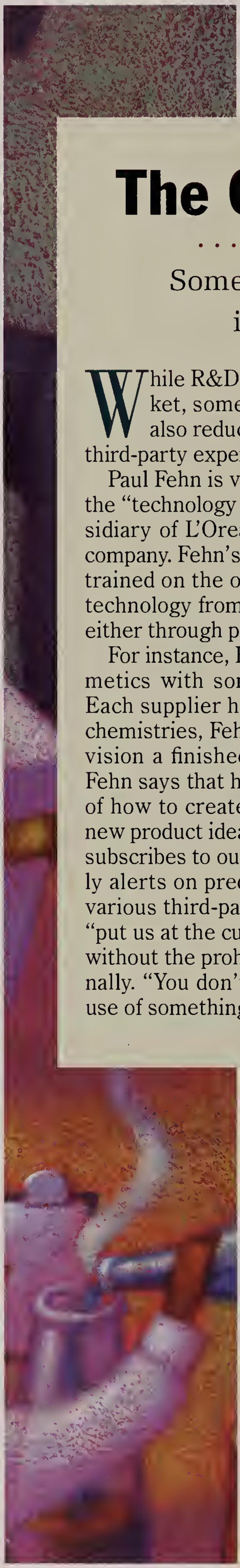

tional processes, it's ripe for reengineering. First of all, the linear method necessarily entails many feedback and fix loops among the different functions. Perhaps more important, however, is the question of what should be driving new product development—market demand or scientific discovery? With the latter, companies run the risk of designing products around what R&D has given them rather than upon innovations mandated by customers.

According to Cambridge, Mass.-based consultancy Arthur D. Little Inc., among the critical best practices for capturing value from technology (technology meaning R&D in this case) are the need to "create a technology vision and strategy to underpin product development efforts" and to "build a partnership between business and technology management to ensure strategy alignment." In other words, just because R&D has invented something interesting doesn't mean that it accords with a company's core market strategy.

The new R&D paradigm works more along the lines of Owens-Corning's Materials Applications & Design Center. The Toledo, Ohio-based company, whose products include insulation and roofing materials, created the center in 1994 in an effort to improve productivity by 6 percent annually—in part by cutting product development cycle time through process integration, according to CIO Mike Radcliffe.

The centrally funded center (traditionally, each division funds its own research) has a two-pronged methodology: First, scientists and engineers from each division's research lab relocate to the center to work on particular projects. According to center leader Bill Fausey, these tours of duty last about two years. Thus, he adds, a scientist whose usual affiliation is with the insulation division can cross-pollinate ideas with, say, an engineer from the polymer division, forging once-nonexistent links among the separate divisions' research communities. Next, as soon as a concept hatches, line business-unit people join the team. While development continues in the lab, market research and marketing folks concurrently investigate the potential market for the embryonic product.

Development continues in this parallel fashion throughout the life of the product, says Fausey. "From day one, we'll have a plant manager on the team, even though there is no plant yet. Or we'll have a marketing manager, but no product yet," he says. "We're actually working on the process and developing the product at the same time."

Finally, when the center spins a product out into the manufacturing arena, it doesn't just toss it over the wall and move on to the next project. Instead, says Fausey, "about half the people on the development team will roll out to the business unit" along with the new product, cutting down on the feedback loops endemic to more traditional development. "Our lab is not static. We are successful when we spin something out. We don't keep anything."

Fausey admits that parallel development can be risky. For one thing, the company may incur higher initial costs from putting parallel efforts behind projects that are

The Outside Option

. . . .

Sometimes the best ideas are invented elsewhere

While R&D integration initiatives will cut time to market, some executives point out that R&D units can also reduce cycle time by building ties to specialized third-party experts—knowledge outsourcing, if you will.

Paul Fehn is vice president of R&D and vice president of the "technology surveillance" group at Cosmair Inc., a subsidiary of L'Oreal S.A., the $10.5 billion beauty products company. Fehn's six-person group functions as a set of eyes trained on the outside world. When they see a promising technology from an outside source, they bring it aboard—either through partnership or acquisition.

For instance, Fehn's group co-develops possible new cosmetics with some of Cosmair's raw-material suppliers. Each supplier has a deep but narrow expertise in certain chemistries, Fehn says, but may lack the knowledge to envision a finished product from some new breakthrough. Fehn says that his group, which has a wider understanding of how to create and package a cosmetic, can help pluck new product ideas from the raw ingredients. His group also subscribes to outside information services that send weekly alerts on predefined areas of interest. Together, these various third-party sources of innovation and intelligence "put us at the cutting edge of technology," says Fehn—and without the prohibitively high costs of creating them internally. "You don't have to own the resource to make good use of something."

–C. Hildebrand

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eventually killed. But he also points out that this parallel marketing work helps identify and shut down unworthy projects at an earlier stage than in a linear process. Most importantly, the new method can cut development time in half—or better. For example, Owens-Corning's last major traditional development effort took four years to produce a super-insulating product. The first parallel project—a new "itch free" insulation fiber—"went from lab demo to product for sale in 18 months," Fausey says.

> *Rigorous planning and preparation can insulate projects from some of the dangers of a speeded-up development cycle. The aim, says Polaroid's Bill Smythe, should be "to make sure resources and deliverables match up to market needs."*

AT POLAROID Graphics Imaging in Waltham, Mass., a division of Polaroid Corp., Senior Corporate New Product Program Manager Bill Smythe says that his department, an applied research group dedicated to the Graphics Imaging division, now devotes more time than in the past to preparation and planning. The purpose of this, he says, is "to make sure that resources and deliverables match up to market needs. We're clearly doing things much faster than we've ever done them before."

Polaroid uses concurrent engineering teams to develop new products so that once, for example, a new laser printer is defined, different teams will develop different parts simultaneously and feed the results to the core printer team. The end result, Smythe says, is to get the product out the door as soon as possible.

A key to these collaborative methods is having transparent access to information from the beginning of a project until the new widget goes out the door. To that end, Owens-Corning is implementing a central repository of video, voice, text and graphics that pertain to each project. (Of course, this won't work if a company's computing infrastructure doesn't jibe. See related story, Page 71.) This can also cut down on cycle time by reducing redundant efforts, says Larry Miller, Owens-Corning's global development leader for information services. If teams can leverage everybody else's knowledge, development teams can cut more time out of the product cycle. "Why retrace steps? If a team is wondering, 'Have we ever dropped asphalt into a glass spinner to see what happens?'" the repository should have a record of any such experiment, he says.

This ability to access a company's knowledge history can also help with resource and project planning and tracking, another important weapon used in integrated R&D efforts. Without such planning, "companies spend too many resources on the wrong projects and never kill the projects that need to be killed," says Douglas Boike, vice president at Mercer Management Consulting.

Boike recounts the story of a large specialty materials company that analyzed 50 or so R&D programs for such dimensions as potential revenue, total cost of implementation, stage of development, nature of target market (growth or mature industry) and whether a given project amounted to repackaging old concepts rather than working with new ideas. The result, he says, "was that they could look at their R&D asset portfolio and see that they'd made tons of investment in mature businesses and relatively little in growing businesses"—and conclude that they needed to adjust their spending accordingly.

The key, he says, is to look for R&D dollars being spent across a number of functions rather than merely in the budget bucket officially marked "R&D"; for example, manufacturing may be funding de facto R&D through its process improvement efforts. Although most companies have not yet reached this level of portfolio management, Boike says that increased R&D integration efforts will eventually lead many firms down this path.

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JOHN KING: *Delta's former CIO wasn't looking for a traditional outsourcing arrangement with AT&T GIS.*

READY FOR
TAKEOFF

After years of razor-thin profit margins,
Delta Air Lines teamed up with AT&T to improve
its IT operations and cut costs.
The partnership is not a traditional outsourcing
arrangement, and observers wonder,
"Will it fly?"

BY DANIEL GROSS

SITTING ACROSS THE TABLE FROM REENGINEERING GURUS JAMES CHAMPY and Michael Hammer, John King knew he was entering uncharted territory. Since assuming the post of CIO at Delta Air Lines Inc. in November 1990, King had been casting about for ways to improve how way the company handled its information technology. In those days, Delta was spending between $150 million and $200 million annually on IT. Satisfied that its wide array of applications were at the industry's best-practice level, Delta nonetheless found it couldn't efficiently produce new software for the emerging client/server computing environment. "It's just too slow to try to develop applications for these big mainframe systems," says King, a smooth-talking Georgia native who joined Delta as a truck driver in 1976.

Determined to avoid the trap of continually writing new code, King had set out to find a better, more radical solution. And that was exactly what he got during the skull session in Boston with Champy and Hammer, the management team who penned the best-selling *Reengineering the Corporation.* Several weeks later, King invited Hammer to spent a day in Atlanta with Chairman and CEO Ronald W. Allen and other Delta managers. King hoped Hammer could distill his views on "core competence"—the notion that companies should focus on only the pro-

PHOTO BY SONNY WILLIAMS

cesses and products at which they excel. King was now convinced that Delta had to stop chasing new technology. "We decided that the quickest way to improve would be to ally ourselves with a company whose core business was doing those things," King says.

In addition to Delta's IT dilemma, King knew that the airline industry in general was struggling to stay alive. Virtually all U.S. carriers were operating with razor-thin profit margins. After losing money from 1990 to 1993, the industry showed a paltry 1 percent profit margin in 1994, compared with about 4 percent for all U.S. industries, according to the Air Transport Association.

Delta's numbers didn't look any better. The airline found itself flying into stormy financial skies between 1991 and 1994 when it racked up losses totaling $1.65 billion. In April 1994, Delta announced its Leadership 7.5 initiative, designed to cut annual operating costs by $2 billion by 1997. Under the plan, Delta would slash its payroll by approximately 15 percent, unilaterally cap the commissions paid to travel agents and close its smaller sales offices.

Given the frugal environment, King knew that hiring new programmers and IT experts to oversee the shift from mainframe systems to client/server systems was out of the question. Outsourcing Delta's IT functions was an obvious alternative, since Delta already farmed out its data entry to another company. But King wasn't looking for a traditional outsourcing arrangement. Aside from servicing Delta, he wanted the company to be in a position to reap the benefits of the applications it had de-

This Is Your Captain Speaking...

TransQuest's CEO takes over the controls of an unconventional outsourcing operation

For William Belew, becoming CEO of TransQuest Information Solutions was the culmination of a 26-year career in the emerging IT industry. Belew joined Dallas-based Texas Instruments Inc. in 1969 as a computer programmer, and rose to direct the company's global information technology infrastructure. From TI, he moved to CSX Corp. as vice president of information services, and then jumped to the CIO position at W.R. Grace & Co. in 1992.

Although he managed 150 people at Grace and had bottom-line responsibility for another 750, that experience didn't explicitly prepare him for running TransQuest. "I think the biggest change has been the breadth of concerns I'm involved in," Belew says, in his bass Texan drawl. "The sense of responsibility that one has in managing a large enterprise like this is very challenging."

Instead of worrying about a single division, Belew now finds himself concerned with a dizzying array of issues, problems and policies that range from employees' benefits packages to disclosure requirements.

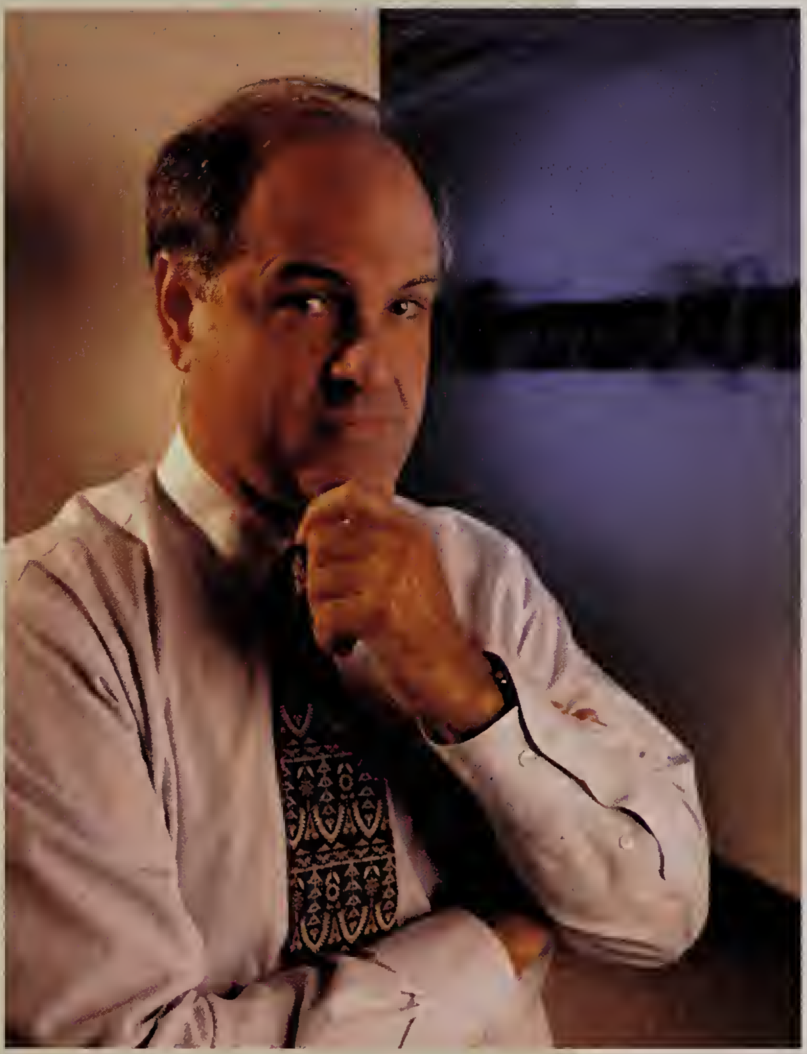
As CEO, Belew also represents the public face of TransQuest as it tries to carve out a corporate identity separate from that of Delta Air Lines. The company has just received its own membership in the Atlanta Chamber of Commerce.

While Belew didn't bring with him a cadre of loyal officers, he hasn't exactly flown solo, either. Senior experts at Delta and AT&T GIS have provided crucial support and advice. Nonetheless, the last several months have been something of a whirlwind. "I'm just now beginning to come up for air," he says, tilting back in a chair in a conference room adjacent to his office.

The biggest surprise so far? Instead of being more detached from the day-to-day operations, Belew finds himself intimately involved in details. "I've spent a great deal of time helping the people in our sales and marketing group on some of the deals," he says. "I put myself out on point with the customer."

He adds, with a weary chuckle: "Detached is definitely not a word I would use."

–D. Gross



WILLIAM BELEW: *As TransQuest's CEO, Belew helps the company carve out its corporate identity.*

PHOTO BY SONNY WILLIAMS

veloped. "The real value is to use IT to cause business results," says King.

Several companies expressed interest, but the choice quickly boiled down to AT&T Corp.'s Global Information Solutions (GIS) unit. In fact, AT&T GIS already had a substantial presence in the airline industry. "We were active with all the major airlines in some shape or form," says Gary Cotshott, vice president of worldwide customer support services at AT&T GIS.

And AT&T GIS had a longstanding relationship with Delta, having provided the company with everything from workstations to communications services. "It was a match of competencies. We had the application systems and needed the infrastructure talent. They had the infrastructure talent and needed the systems to sell," says King. "And that was what finally pulled us together."

In August 1994, Delta and AT&T GIS announced an agreement to form a joint venture whose 1,200 employees would handle all Delta's computing and communications requirements, save reservations. Reservations would be shifted entirely to Worldspan, a joint venture among several airlines (including Northwest Airlines and TWA), of which Delta owns 38 percent.

Delta and AT&T GIS found they made a snug fit. "The motivation in a traditional outsource agreement is to contain costs by handing over problems to someone who is better equipped to deal with them," says Cotshott. "In this case, both AT&T GIS and Delta were focused on bringing new value."

Most important, the two companies seemed to be on the same wavelength—crucial for any joint

> **"IT WAS A MATCH OF COMPETENCIES. WE HAD THE APPLICATION SYSTEMS AND NEEDED THE INFRASTRUCTURE TALENT. THEY HAD THE INFRASTRUCTURE TALENT AND NEEDED THE SYSTEMS TO SELL."**
>
> *–John King*

Outsourcing on the Fly

Airlines shift IT spending from internal to external providers

The marketing of IT products and services to airlines is a booming business. In 1993, the transportation industry spent $19.1 billion on IT, with airlines accounting for 35 percent of that total, according to G2 Research, a Mountain View, Calif., market research firm. Most of that total was spent either on hardware (28 percent, or $5.3 billion) or internal services (30 percent, or $5.8 billion).

By 1998, G2 Research expects IT spending in transportation to soar to $35 billion, as spending priorities shift dramatically. While total IT spending will rise an estimated 12.8 percent annually, spending on external services will grow at a 23.6 percent rate, and software spending will grow at 19.9 percent. Expenditures on external services will rise from $2.8 billion in 1993 to $10.1 billion in 1998. Meanwhile, spending on software will rise from $3.9 billion in 1993 to $9.6 billion in 1998. "There's a new industry emerging [to serve] the shift from spending internally to an external market," says Bill Zint, vice president of sales and marketing at Atlanta-based TransQuest Information Solutions.

In joining forces to crack the growing IT market, Delta Air Lines and AT&T GIS are part of a larger trend of major players in different industries finding common cause. "This is a regular event now, where the end user joins with the vendor or the supplier in pursuing a joint venture approach or joint marketing approach to a market defined by the capability of the companies involved," says Graham Kemp, president of G2 Research.

And Delta and AT&T aren't the only corporate behemoths trying to cash in on the sea change. In January 1995, EDS and Lufthansa German Airlines announced a joint venture, Lufthansa Systems GmbH. Based in Frankfurt, the 1,000-employee firm will supply Lufthansa and its companies with all IT services under a 10-year contract. Lufthansa Systems, of which EDS owns 25 percent, shares TransQuest's goal of marketing services to others in the airline industry. "We've put together a sales force, and we've been actively selling and marketing since day one," says Nathan Lanford, president of EDS's Air Transport Services unit.

In fact, outsourcing is on the rise in the airline industry generally. "Most of our new business is coming from airlines looking to save money," says Lanford.

Many startup airlines are not even bothering to set up IT infrastructures. Atlanta-based Nations Air Express Inc., which has been ferrying travelers from Boston, Pittsburgh and Philadelphia since last March, hired World Technology Systems in Atlanta to handle its reservations and revenue-accounting systems. Estimated annual savings: $1.5 million.

–D. Gross

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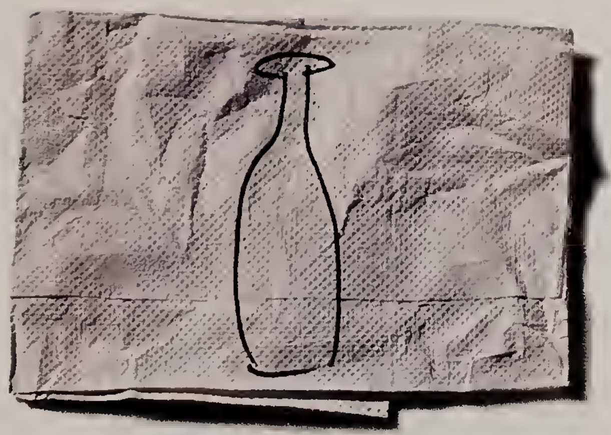

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GARY COTSHOTT: *The AT&T GIS executive encouraged TransQuest to focus on bringing new value to the joint venture.*

PHOTO BY TOM ROGOWSKI

venture. "You couldn't do one of these deals unless you had similar kinds of corporate cultures that worked together and reciprocal knowledge sharing," says Allie Young, a senior analyst at market researcher Dataquest Inc.'s Westborough, Mass., office. In choosing a name, the two companies turned to Interbrand Schechter Inc., a New York-based consulting firm. The company was publicly christened TransQuest Information Solutions at last December's IT Services '94 convention in Santa Clara, Calif. TransQuest officially opened its doors on Jan. 1, 1995.

One of the first joint tasks for Delta and AT&T GIS was to find a CEO for TransQuest. "It was understood from the beginning that we would look outside the two companies," says King, because both parties wanted the newly constituted venture to be untainted by the bureaucratic corporate cultures of their parent companies. In addition, they were seeking a rare combination of attributes: a capable manager with expertise in converting from mainframe to new technologies as well as a leader versed in development methodologies and strategy.

After consulting with connections and industry sources, Delta and AT&T GIS drew up a list of prospects and interviewed six candidates. Ultimately, they tapped William Belew, vice president and CIO at W.R. Grace & Co. in Boca Raton, Fla. In October 1994, the 47-year-old Texas native was named president and chief executive officer of the new venture (see related story, Page 80).

In deciding where to locate, it turned out that the apple didn't fall far from the tree. TransQuest's executives occupy the 11th and 12th floors of a brick and glass building just off I-85 in Atlanta in an area of boxy office buildings, airport hotels, and fast-food joints. Delta's revenue-accounting operations are on the lower floors. And the building is just a stone's throw from Delta's headquarters. Most of TransQuest's employees work out of various Delta units.

For its part, AT&T GIS plans to shift 31 of its key executives into management positions at TransQuest. "They will infuse the organization with AT&T GIS resources in key expert areas that will bring much more structure to the work that's being done inside TransQuest," says AT&T GIS's Cotshott.

But most of TransQuest's IT foot-soldiers came from Delta. Prior to the formation of TransQuest, about 1,500 Delta employees were engaged in IT. Delta shifted 1,100 to TransQuest and another few hundred to Worldspan. About 150 existing IT staff remained at Delta as internal auditors. Employees were given some choice in their final destination. "Most of the people got their first choice," says King.

Extensive efforts were also made to create a culture that would give TransQuest employees more freedom than they had as Delta employees. "One of our key challenges is to establish a decidedly different culture," says Belew.

Because TransQuest functions as an independent IT company rather than as a dependent IT department within a large organization, "the biggest transformation was that the culture went from being an internal and entitled environment to one where you have to deliver just like a professional services company," says King. TransQuest employees would no longer function as support staff in a large operation but rather would become the heart and soul of a free-standing competitive company.

TransQuest employees can also earn bonuses of about 10 percent based on the company's performance. At Delta, only the most-senior employees have incentive

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– Ralph Waldo Emerson

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programs. Delta and AT&T GIS have installed a set of benchmarks—in development productivity, operations cost-efficiency, service levels and customer satisfaction. "These performance parameters drive the incentive compensation for everyone in the organization," says Belew.

The performance measures also affect AT&T GIS's ability to earn a management fee. While TransQuest's profits return to the parents on a 50-50 basis, AT&T GIS also receives a management fee (if TransQuest meets 50 percent or more of the performance goals). "It very strongly motivates AT&T GIS to make sure they have the right talent coming to the company," says King.

The initial service agreement calls for TransQuest to deliver some $2.8 billion in technology products and services to Delta over 10 years—at cost. Since the contract with Delta is non-exclusive, TransQuest must compete for even this nonprofit business. "If another company outbids TransQuest, Delta has the option to buy elsewhere," says King.

The only way TransQuest can make a profit is by selling products to others. TransQuest already has a large built-in inventory of products—over 3,000 applications that have been produced by Delta over the years. "We took this large list of applications and started to look for those that were strategic for Delta and those that would bring us value," says Bill Zint, vice president of sales and marketing at TransQuest.

Zint and his department have identified several flagship products, which fall in three areas: decision support, optimization (to help the airline optimize its human and capital resources) and efficiency solutions (intended to improve cost-efficiency). One product is a graphical flight follower that allows airlines to graphically track their planes in the air. Another database called ELVIS—which stands for Electronic Lexicon and Visual Information Systems—allows mechanics to rapidly access information on electronic connectors.

"THE MOTIVATION IN A TRADITIONAL OUTSOURCE AGREEMENT IS TO CONTAIN COSTS BY HANDING OVER PROBLEMS TO SOMEONE WHO IS BETTER EQUIPPED TO DEAL WITH THEM. IN THIS CASE, BOTH AT&T AND DELTA WERE FOCUSED ON BRINGING NEW VALUE."

–Gary Cotshott

TransQuest's three-tier marketing strategy calls for selling individual products to the larger airlines; selling bundles of products to smaller airlines; and selling services and products to railroad, trucking and hotel companies. These latter industries are starting to use applications for scheduling, pricing and inventory management that airlines have been using for years.

Some outside observers believe that the personnel decisions, which resulted in no significant reduction of employees, more accurately reflect Delta's old-style paternalistic culture than TransQuest's new competitive posture. "How can this be a good deal for Delta Airlines when all the people are still on the payroll?" asks George Logemann, director of management strategies with the Boston-based Yankee Group. "Why is Delta Air Lines willing to pay all these salaries when there isn't any new closed business? Isn't there something wrong with this picture?"

Delta argues that it has already saved money simply by locking in low IT costs for the next 10 years.

So far, TransQuest has been engaged largely in erecting scaffolding and laying foundations. Belew and the newly installed managers have set up architectural standards, a new development methodology, project management standards and a project accounting system. TransQuest has also conducted a survey of employees to determine their level of knowledge and has developed a new training curriculum to get laggards up to speed.

But TransQuest is starting to emerge from the shadows. In May, Tom Hunt, TransQuest's vice president of integrated solutions, was the keynote speaker at the International Air Transport Association convention in Kuala Lumpur, Malaysia. And the firm has been entertaining a steady stream of curious visitors, including Federal Express Corp., TWA, Cathay Pacific Airways Ltd. and Active Aero Charter Inc. "About a month ago, we started our global marketing effort," says Belew.

TransQuest has not yet announced the closure of any significant deals. Company executives note that selling such complex applications isn't like selling candy bars. "The selling cycle on some of these products can be very lengthy," says Zint.

One outside observer isn't surprised at the slow start. "My own jaundiced view of this stuff is that it's a tough sell," says Graham Kemp, president of G2 Research Inc., a market research company in Mountain View, Calif.

Other analysts remain unconvinced of the utility of IT service arrangements like TransQuest, because ventures between airline and technology companies remain largely untested. "Most of the ones that I've seen are in their initial stages," says Dataquest's Young. "We need to come back and visit them in about a year to see if they have realized any real opportunity."

But IT executives in the airline industry are urgently pressing full steam ahead. As King says: "You just can't afford to be too patient these days." He should know. On July 1, King left Delta to start his own consulting business.

Daniel Gross is a freelance writer based in New York.

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Surround strategies can help meet the demands of modern-day code without tossing out legacy systems

BY SHAILENDRA JAIN

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Sure, client/server is starting to reach enterprise prime time, but a radical flashcut to *new and improved* for true mission-critical applications is unthinkable. Fortunately, there's good news—and plenty of sound technology—for constructive compromise: technology that will give incremental business gains with minimal risk and approaches that let companies nibble away at bread-and-butter systems without tossing them out completely. They're called surround strategies. If you can't beat your legacy systems, join them with the best parts of client/server to achieve near-term ends while building toward the future.

ILLUSTRATION BY STEVE MUSGRAVE

"Screen scraping," once the most popular of the surround strategies, just begins to scratch the surface of what's possible, and it offers the least payback. A variety of other more aggressive architectural approaches are also being used by the largest IS organizations.

Essentially, surround strategies let you make up for the shortcomings of your legacy systems by replacing some part of those systems with new client/server technology built on the front end—at least a GUI and possibly much more. It depends on what and how much you decide to bring upfront.

All of the strategies begin by dividing the legacy system into three layers—presentation, process and data—and transforming the first, and perhaps some or all of the second and third layers, into a GUI server, a function server or a database server. (This application triumvirate is occasionally referred to as a three-layer or three-tier client/server *software* architecture but should not be confused with the classic three-tier *hardware* architecture, made up of desktop workstation, midrange server and host mainframe.)

Once you've divvied up your system, the challenge is to get the old legacy and the new client/server portions talking. The five basic methods

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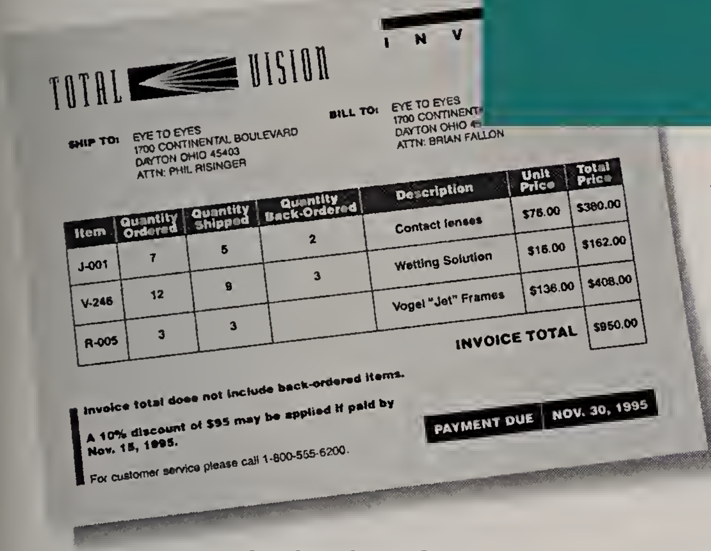

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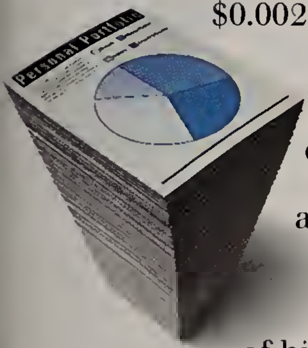

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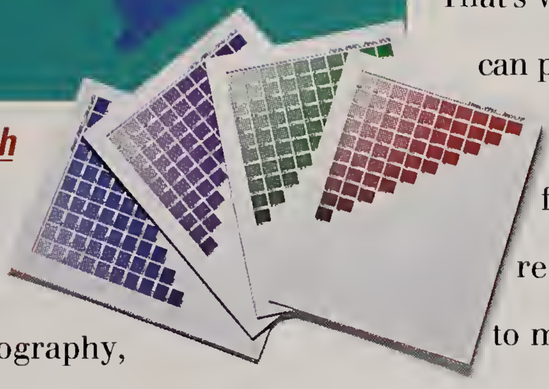

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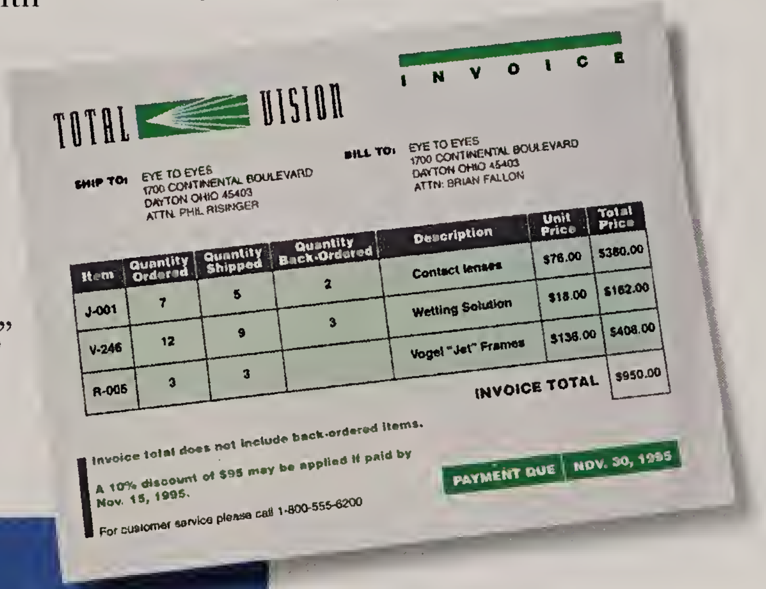

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of doing so are called screen scraping (or presentation mapping), process mapping, data mapping, legacy data replication and legacy database server. As their names imply, the first three methods use some type of mapping layer between the two. The latter two methods require no mapping or translation—simply a messaging layer for direct back-end data updates.

Presentation Mapping

Also known as screen scraping, presentation mapping replaces the legacy presentation layer, putting a pretty face on your host-based application. A PC replaces the dumb terminal in the standard master/slave host-based architecture. A new client-based application taps into the data stream that used to feed the dumb terminal, parses out the incoming fields and maps them to a GUI on the PC.

Most vendors of PC-to-mainframe connectivity tools, including Attachmate Corp. and DCA Inc., now provide screen-scraping extensions to popular front-end development tools such as Microsoft Corp.'s Visual Basic.

Screen scraping offers minimal but immediate gains for minimal risk. Because the approach limits the user interface to the flow of screens in the existing legacy system, any attempts to reengineer current processes are severely constrained. However, the approach recently paid off for a hotel company with a fairly new mainframe-based application that used dumb terminals. The company's processes and data structures were in good shape, but management had determined that a GUI would reduce the employee learning curve and turnover. Screen scraping provided a solution, although it offered no additional flexibility or customer focus.

PRESENTATION MAPPING

Conditions: Existing processes and data are adequate.

Pros: Improved useability with GUI frontend; immediate gains, minimal risk.

Cons: Limited to current screen flow; no additional flexibility to modify data or processes; minimal gain; risk of delays in synchronizing GUI with ongoing changes to back end.

Products: Mozart (Mozart Systems Corp., Burlingame, CA); Rumba Tools (Wall Data Inc., Redmond, WA); VISION:Flashpoint (Sterling Software Inc., Dallas);Enterprise/Access (Apertus Technologies Inc., Eden Prairie, MN)

Sometimes, however, those decisions can be seen as penny-wise and pound-foolish. A coat of paint may be a temporary solution for crumbling cabinets, but you'll probably end up refacing, if not rebuilding, them sooner or later. So it is with many companies that choose to implement screen scraping.

One of the major causes of actual screen-scraping failure, especially in large-scale applications, is in synchronizing the front and back ends. Companies will typically paint only the most-used parts of their existing applications, allowing users to fall back into the original dumb screens as required. In big IS shops, those responsible for screen scraping are often not those who own the back-end application, and maintaining consistency between the two can be difficult. Many times, the lags cause such problems for users that they lose confidence in the system and end up using their built-in escape route back to dumb terminals.

The consistency problem can be resolved in part with an expert-system-like table-driven application that facilitates rapid updates. The system parses the incoming screen and creates a repository of metadata on the client, which stores the tables that map the old screens and fields to the new. The positioning of fields in the new front-end (scraped) application is not hard-coded; it's driven dynamically by these tables. Synchronizing the front and back ends now merely requires the programmer to update the mapping.

Process mapping

Unfortunately, adding only a new presentation layer is highly inflexible and usually falls far short of supporting the requisite reengineering of business processes. Often, you need to go somewhat deeper into your system because the more of the legacy system you replace, the greater the freedom you will have to reengineer. And, of course, the more risk you incur. But the transition is not an all-or-nothing proposition, and it can happen in stages.

PROCESS MAPPING

Conditions: Back-end processes and data are adequate.

Pros: Supports new business processes.

Cons: Restricted to existing back-end functionality; requires operating on legacy code; can create performance bottlenecks; risk of delays in synchronizing front-end application logic with any changes to back end.

Products: MQSeries (IBM Corp., Armonk, NY); CI (Covia Technologies, Rosemont, IL); PipesPlatform (PeerLogic Inc., San Francisco); MessageExpress (Momentum Software Corp., Englewood, NJ)

Process mapping, also known as "transactionalizing," is the next step in the spectrum of surround strategies. It involves building new presentation and process layers—usually for greater operational efficiency—although it does restrict you to the current set of back-end functionality.

Your existing legacy mainframe system is basically architected to respond to screen events. Process mapping lets you combine one or several discrete screen events to create complete business transactions or events on the front end in a desired sequence. All of the presentation logic is rewritten and placed on the client, and new application logic is built on the front end to interact with the user on its own until all the information required for an entire business process or transaction is complete. The business transaction is then sent up to the mainframe portion of the process layer.

To allow this to happen, you need to make the legacy code respond to business transactions. You could, of course, literally combine the appropriate pieces of legacy code and change the program flow, but that sort of alteration is inordinately complex and labor intensive. Less demanding is opening up the code just

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a bit and putting in additional entry points. Then you build a transaction server that responds to front-end business transactions by calling each piece of legacy code individually that corresponds to each part of the process. The server then sends appropriate messages back via a new messaging layer that supports Unix-to-mainframe or PC-to-mainframe communications. The server can be built on the back end only or split between the front and back ends (you'll probably want to decide based on whether you have more mainframe or client/server programmers available) and must be architected to ensure the integrity of the transaction.

This technique can go a long way toward supporting new business processes. You can completely redesign your front-end processes without regard to the original front-end logic. For example, imagine an existing customer support application that asks for the caller's name and address prior to prompting for the product name and problem. As it turns out, it's not until this latter stage of the legacy process that your representatives often discover the customer has mistakenly called the wrong number for the specific product in question. By transactionalizing the application, the application can be revised to prompt for the product name first, allowing your support personnel to waste no more time if the wrong number has been dialed.

A leading telecommunications company wanted to pursue its reengineering incrementally and started, like many companies, with customer service because that's where companies can often make the most immediate and significant gains using client/server technology. This company first tackled the billing inquiry portion of its monolithic customer service application because it was particularly cumbersome and a fairly sensitive process. In the past, the company's customer reps had to laboriously navigate through multiple screens to first reference a particular bill, then to adjust it per the customer's request. Process mapping lets them create a specific billing adjustment application that employs business rules to automate every step and completes the entire transaction with a more natural, efficient flow, using fewer keystrokes and less time.

DATA MAPPING

Conditions: Data structures must be extended or modified.

Pros: Most flexible strategy; allows incremental growth of client-server; no need to crack open legacy data code.

Cons: Demands more time and resources; delays in synchronizing front-end application logic with any changes to back end.

Products: OEC Toolkit (Open Environment Corp., Cambridge, MA); Open Server (Sybase Inc., Emeryville, CA); SAM:Batch (Software Clearing House Inc., Cincinnati, OH)

The success of process mapping can be limited by how well the existing back-end code is written, documented and understood. The necessary surgery involved can be too painful if it's difficult to spot business transactions in the legacy code.

Process mapping can also create performance bottlenecks if, in one's zeal to create optimal upfront business transactions, some of the same legacy events are called repeatedly by overlapping processes and are forced to execute redundantly. A legacy application, for example, might change both the customer phone number and address within the same program. To increase efficiency when only one needs updating, two separate front-end transactions are developed: phone number change and address change. However, the back-end code still executes both the phone and address change together. Thus, to change a customer's phone *and* address now involves changing both twice on the back end. Some implementations of process mapping, improperly analyzed early on, involve many levels of redundant code execution.

Data mapping

Sometimes the application flexibility needed requires more than changing the front-end process; the data structures must be extended or modified as well. The next surround strategy—data mapping—lets you go to the next step and bring some new data structures along with the new processes and presentation upfront to the client.

Data mapping provides the most flexibility of the surround strategies because you are essentially carving out and reengineering a whole piece of the application. The task then becomes writing a new application layer that synchronizes the new front-end data and the legacy data structures that remain on the back end. Because the actual data schema is different, you'll have to build a translation layer or server to map or apply the updates to the correct data on the back end.

Consider yet another telecommunications company. It wanted to move only the long-distance piece of its customer order application to client/server so that it could more easily add new types of service offerings. If a customer ordered a change of features, however, the billing system portion of the legacy customer service application still needed to reflect that change. The company chose to post all such changes to the legacy database in batch mode via the translation server prior to running the batch billing system.

You should start any surround initiative by looking at data mapping—not presentation or process mapping—as the preferred approach. It's more time-consuming and demands more resources, but it provides a long-lasting, durable client/server platform for unlimited, incremental process reengineering. You can grow your client/server implementations "cell by cell," slowly overtaking legacy code. Furthermore, you can do so without cracking open the old, undocumented spaghetti code on the back end, significantly reducing business risk.

Data mapping also provides experience in straightforward client/server application development that one doesn't tend to get with the other approaches. You can use all standard client/server development tools, and you are forced to deal with distributed data server issues such as backup, security and performance that

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DATA REPLICATION

Conditions: Back-end database schemas do not require modification.

Pros: Good, clean approach; no legacy code modification.

Cons: Latency in data synchronization; users operate with data that is not up to date.

Products: DB2 (IBM Corp., Armonk, NY); Oracle Server (Oracle Corp., Redwood Shores, CA); Sybase SQL Server (Sybase Inc., Emeryville, CA); InfoPump (Trinzic Corp. Portsmouth, NH); Extract Tool Suite (Evolutionary Technologies Inc., Austin, TX)

you can ignore when all your data remains on the back end.

Data replication

An approach closely related to data mapping is legacy data replication—an architecture that brings some data up to the front end with the application (and may extend it locally) but doesn't actually modify the legacy database schema. Synchronization of the common data remains an issue, but translation is no longer required. If your back-end data formats don't require alterations, this is the way to go.

You may need to buy a replicator product, but the cost is usually not prohibitive. Most of the major RDBMS vendors provide some replication capability, and other third-party products are available for regularly scheduled synchronization of the two databases.

A common application of data replication is sales force automation. In the field, salespeople are provided with a laptop-based database application for booking and tracking orders that shares the same schema as the legacy sales application. When salespeople return to company headquarters, they simply plug their systems into the mainframe and offload the latest data.

Taken further, the sales force may now desire database fields that let them track the birthdays or hobbies of clients—information that can enhance customer relations but isn't a part of corporate reports. The database schema on the laptops could be extended to include this data, but only the legacy database fields are replicated on the back end.

A company can upgrade a legacy application that generates target mailing lists from a mainframe customer database by building a new graphical client-based profiling application replicating the criteria database design down to a local database server, and the database can be replicated down to the new system, which would then process the data extraction request. Results are then retrieved by the client/server application, although the customer database never moved off the mainframe.

The only downside to legacy data replication is that there is some degree of latency in data synchronization. All of the replication products allow you to turn up the frequency to make it nearer to real-time (at the cost of additional system/network utilization), but if you need true real-time synchronization between the two databases, you could consider a database that supports fully synchronous XA-compliant two-phase commit. Unfortunately, the technique has not always proven to be practically feasible.

Legacy data server

The final surround strategy is an option if your back-end data structures are fine as-is and you need real-time data synchronization. Here you downsize the entire application (presentation and process) and leave all of the data on the host, which then becomes, in essence, a database server.

Using the legacy host as a database server is a very clean approach, but there can be some problematic performance and functional limitations in accessing host-based data from a client/server-type front end. For one thing, you can end up with a fat client—an overburdened, underperforming client workstation. You can avoid a beer-belly front end by using a three-tier hardware architecture that incorporates a box in the middle that performs as a function server.

Furthermore, client/server front ends tend to speak only SQL, and support for traditional host-based nonrelational databases (much less data stores like VSAM) is very limited. However, if your application requires only reading the data without updating it, you shouldn't run into any interoperability problems.

One of the nation's larger food manufacturers was updating its mainframe-based distribution management system. The centralized database, or roster, was fine, but it required the 120 trucking contractors to log in for updates. The company wanted to proactively "push" the centralized roster down to the truckers, so it left the data on the back end and developed a front-end application that would automatically log on to the DB2 database and perform remote updates.

To date, too many large-scale reengineering efforts a la client/server have failed, particularly those supporting mission-critical operations. Surround strategies let you convert your system—along with your development processes and your IS staff—incrementally without putting too much on the line. They also give you quicker, demonstrable successes because you are not taking on the world, which in turn will please executive management. CIO

Shailendra Jain is chief technology officer at Trecom Business Systems, a major systems integrator located in Edison, N.J. He may be reached at sjain@trecom.com.

LEGACY DATA SERVER

Conditions: Back-end database schemas do not require modification or extension; need real-time data synchronization.

Pros: Good, clean approach; no legacy code modification.

Cons: Fat clients; accessing non-relational host-based data from a SQL-oriented front end.

Products: PC/SQL-Link (Sybase Inc., Emeryville, CA); Open Gateway (Sybase Inc., Emeryville, CA); EDA/SQL (Information Builders Inc., New York); InfoHub (Trinzic Corp., Portsmouth, NH); VISION: ClearAccess (Sterling Software, Dallas); Cross Access Data Delivery System (Cross Access Corp., Santa Clara, CA)

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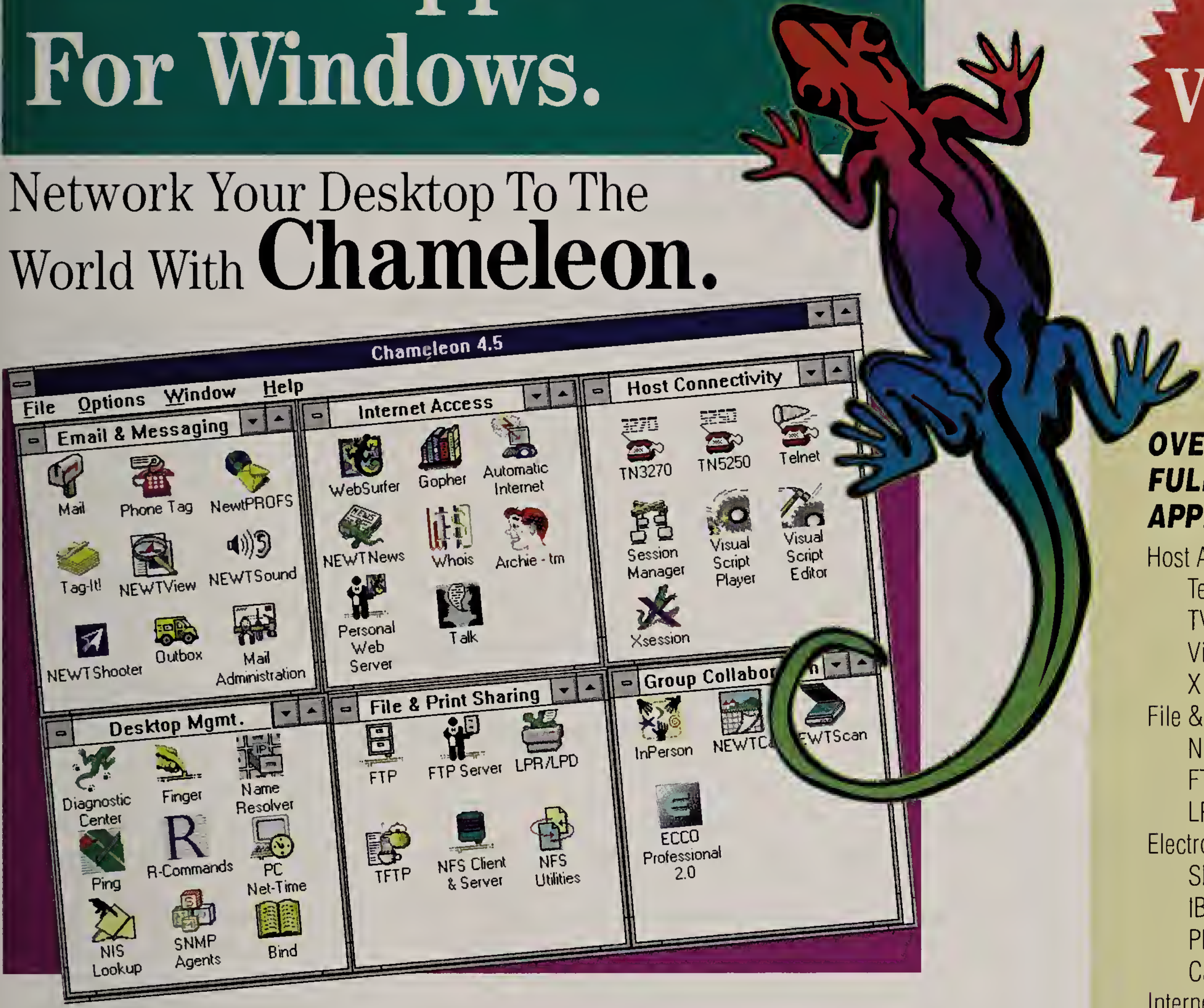

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this guy suggesting that he couldn't pay attention to integrating customers and suppliers, because he was too busy being a cost-cutting hero? Did he convince his boss that that's the way we work? A couple hundred thousand in salary, and we can only do one thing at a time? Great.

ROIT.... I, too, used to do stuff like this, long before it became known as ROIT. I, too, thought I was a great hero, thought I was simply brilliant. Back when online systems were first catching on, and I was getting my MBA, I did an elaborate analysis of employees' use of terminals. Applying principles of marginal cost and queuing theory, I concluded that we were wasting money putting terminals in people's offices rather than concentrating them in "terminal rooms." (Remember those? What a dumb idea!) My math was absolutely correct and my measurements unassailable. I had merely missed the point: I was busy making sure we were applying equipment efficiently when I ought to have been trying to help our people work better. I was so smart, so caught up in metrics, that I became stupid about the business. Of course, I'm not alone in that.

The data center at my former company (see "How I Got Fired," *CIO*, May 1, 1995) publishes a 30-page booklet of its data-processing chargeback rates every fall so that the departments can prepare their budgets. To read such a document cover to cover is to be amazed. It was the silliest thing. We had different rates for mounting a tape at three o'clock in the morning versus ten o'clock at night or two in the afternoon. We had something like 10 different rates for printing at different hours and an equal number for storing stuff online. We had so many rates for so many different circumstances that it was impossible to forecast anything, let alone to budget effectively. Maybe some performance guru or financial person deep in the data-center engine room could have made sense of it, but no mere mortal stood a chance. The data-center team had sliced the baloney way too thin, deluded as they were that this was a rational way to manage. In fact, it was gibberish.

For one thing, only a precious few knew anything about the terms and circumstances upon which the various rates were based. For another, all this baloney slicing required complex mechanisms to keep track of it. Our data-center people were spending more money to *count* than most other departments were spending to *do*.

This same management team spent months and lots of dough justifying a new replacement mainframe versus a used one. They measured everything—plumbing, electricity, floor space, distance between tape drives, residual value (try predicting that with any relevancy in the environments we work in), and much more. They presented their recommendation and got their brand-new box. Six months later, after an acquisition, we needed to add capacity to the data center. The Chairman decreed no new box. So they did the same elaborate study all over again and came up with the stunning conclusion that the new mainframe should be paired with a used one ("It'll work just fine") that was virtually identical to the box they had prudently rejected as inadequate only months before.

I was so smart, so caught up in metrics, that I became stupid about the business.

IT'S NOT THAT WE CAN ignore our costs or fail to challenge the reasons for spending money. We must be certain we are making money and not merely straightening out curves for the sake of appearing to have something to do. But some of this ROIT stuff is completely inane. One well-respected professional in our field has devised a 60-page description of 34 ways to measure the value of computing organizations. He's a consultant now, which may explain some of the excess. And I have heard of a whole company that concentrates on measuring the value of IT, and they run around interviewing people to populate some 800 different data points. Figuring out whether NAFTA works or not doesn't take 800 data points. Nobody understands the reports that result from these interviews since they mostly consist of hundreds of numbers. But some people still evidently believe that the more complicated the analysis, the higher its value.

There is a trend now, in my former company and in others, to shift the burden of this infinitesimal measurement of value from the folks incurring the expense to the folks who ultimately pay the bill. So, the business unit or department now must "make the case" for some new system. This, too, makes little sense to me. Should the business unit have to figure out the ROI of replacing the boiler in the basement? The sooner we stop screwing around as though we are some unique appendage to our businesses, the better.

Obviously, we still need to know the likely benefit of making investments in change. When you spend $40 million on some conversion, you'd better know why you did it. If life in your company isn't better afterwards than it was before, well, that's not progress. But let's be real. All these hair-splitting metrics just beg the question. The fixation with establishing our worth to the business is symptomatic of a deeper problem. The more convoluted the measurement methodology, the more severe the psychosis.

Here's a new mantra: Value Is Visible. If you find you are spending a lot of time and energy measuring the value you're allegedly adding, you probably aren't adding very much. Eight hundred data points to measure the return on an investment is pure baloney. CIO

W.F. Dyle is the pseudonym of a working CIO whose observations appear regularly in CIO Confidential.

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Your Bloody ROIT

PHOTO BY JOHN RAE

Some IS groups devote a lot of resources to minutely measuring the value of their contributions. They call it ROIT. But not everyone thinks it's such a hot idea.

BY W.F. DYLE

A RIDDLE: How is an IS organization like the local department of public works? Well, for one thing, infrastructure. The DPW invests in all these expensive trucks and plows and bulldozers, and other exotic heavy machinery. And it has all these drivers and operators and engineers hanging around, sucking up payroll. So they'd all better be *doing* something, or else the heavy equipment will be taken away and they'll be laid off.

Now, everyone—especially in the northern states—understands why you need the DPW in the middle of a snowstorm. But at other times, such as the height of the summer, it seems all they do is trim trees and knock down stone walls and claim pieces of citizens' front yards by eminent domain so they can straighten out some inoffensive bend in the road. They never quite finish with such projects; just when you think they're about ready to wrap one up, like Finnegan they begin again. The operating precept of the DPW is "use it or lose it," which its practitioners likely learned at an early age, perhaps while playing with their Tonka trucks: "Johnny, if you're not going to play with that thing, let your sister have a turn."

And now, it turns out, DPW units are commissioning in-depth studies of their "RODPW" (return on the DPW) in order to protect the franchise from all those cranky, budget-slashing taxpayers. In the IS world, *our* version of franchise protection is called ROIT—return on investment from information technology. And I, for one, think it's a big mistake. We in the CIO business are again doing something silly: setting up false idols and then dedicating our careers to worshipping them.

This ROIT stuff makes no sense to me. (As with the DPW flavor, I suppose it's meant to be our own little customized piece of the ROI puzzle. And as we have demonstrated repeatedly in the past, when some other profession already has a name for something, we can't resist picking something different to be our personal mantra.) But, look... ROIT is just another way of saying "return on investment"—what you get for what you pay. This is not a big deal. If we keep treating it as though it were rocket science, we will have missed the forest and hit the tree (giving some bored DPW guy the opportunity to daub tar on the bare spot where we tore away the bark).

In any case, I think we spend too much time on justification, belaboring a problem that is, for the most part, going away. (1. So much of what we invest in now is a heck of a lot cheaper than it used to be; when was the last time you ordered a multimillion-dollar box? And 2. A lot of the people we bamboozled into believing only IS owned the Holy Grail started minting their own grails behind our backs.)

ROIT.... Some professor at NYU tells *The New York Times* that the new role of the CIO is to find "short-term, high-yield, revenue-contributing factors." Baloney. The CIO's job is to figure out when and how to use technology to make the place better. You don't have to measure that to six decimal places if you *really are* making the place better. People will know. If they don't know, you blew it. And if you blew it, they'll know that, too.

I read an article describing how some CIO had cut the IS budget from $1.2 billion to $770 million, the staff from 7,000 to 4,800 and the data centers from 200 to 40. "Now," the professor said, "IS can move away from cost cutting and start integrating customers and suppliers." That's baloney, too. We're all supposed to know about parallel processing these days; but you'd think we might know a little bit about parallel *processes*, too. Was

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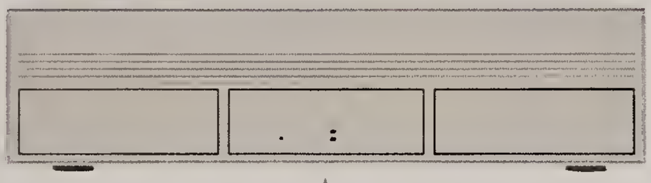

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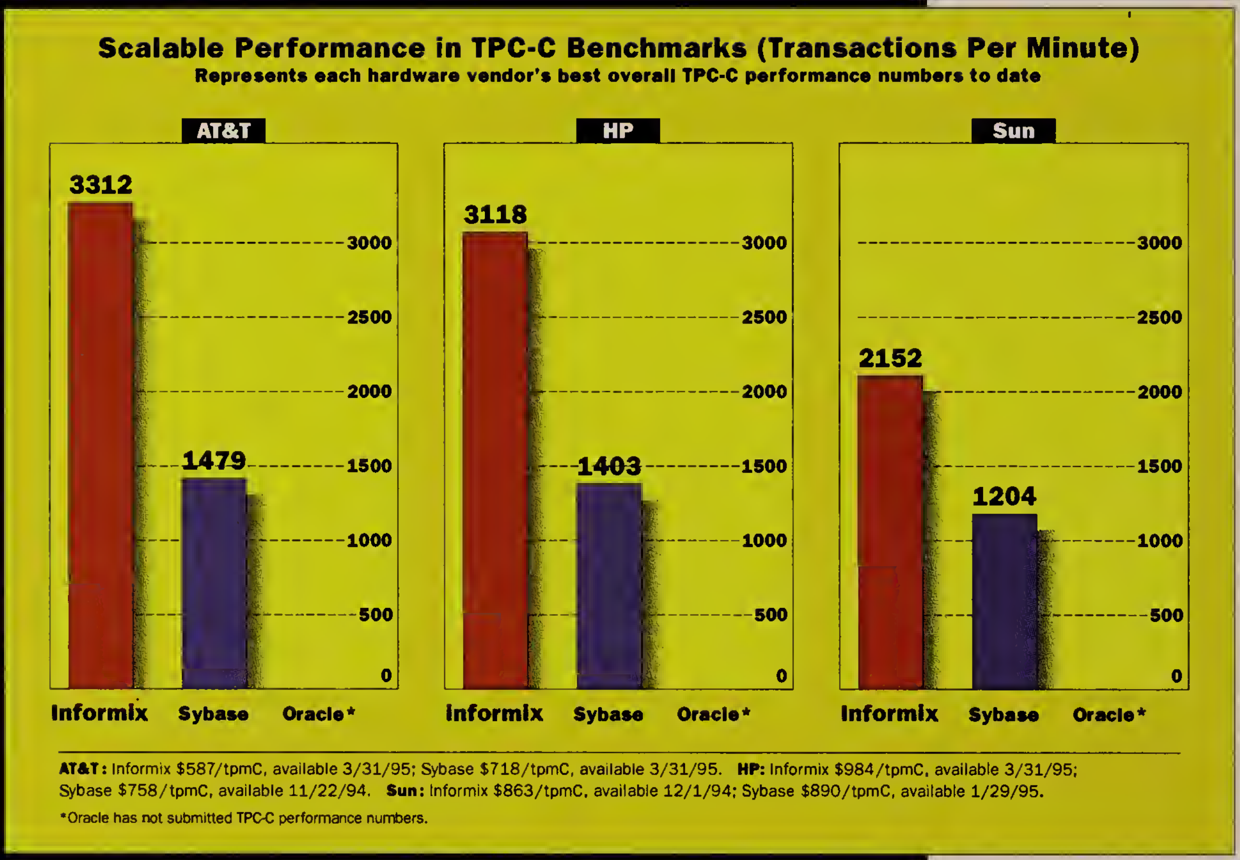

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